

COAL AGE

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No. 21

Here is a little incident that happened during the depression of 1907. It's worth repeating now as a warning, because of the present unfavorable condition of the soft coal industry.

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AMINE SUPERINTENDENT was given orders by his general manager to bring his cost sheet down to a certain figure or shut up shop. The figure in question was the contract selling price of the coal. At the time the contract had been closed, the mine was running full time and the price obtained left a fair profit per ton of coal; but during the depression, orders were gradually cancelled until the output had to be reduced about 50 per cent. Naturally, the mining cost began to climb and the general manager found himself facing a loss on every ton produced.

The superintendent realized immediately the manager's predicament and explained the situation earnestly to all of his subordinates; between them they made some substantial reductions, but in spite of all of their efforts, they still found a difference of about 8c. between the cost of coal and the contract selling price. Now it happened that 8c. per ton was the exact cost of yardage advancement for the mine, and this fact arrested the superintendent's attention and eventually led to his undoing.

He suggested to the manager that they might

at least break even if he could discontinue for a few months all yardage advancement.

He explained further that when market conditions became normal again, he could gain back the exhausted yardage reserve by double shifting all narrow work.

This appealed to the manager, and the superintendent was patted on the back.

But at the end of a few months, market conditions did not improve. This time the manager suggested taking chances and insisted on holding back on narrow work a few months longer.

To make a long story short, when market conditions did again become normal, the superintendent found that, with the working places available, he could not get over 60 per cent. of the output required, and at best it would take him several months to effect a noticeable improvement.

He explained conditions fully to the manager.

The manager fussed and fumed and insisted that it was all a great surprise to him and always wound up by persistently maintaining that he had been misled by the superintendent from the beginning, else he would have frowned on such a course at once.

RESULT
The Superintendent found
things so unpleasant
that he resigned.

MORAL
It's so very easy to overrun
a credit account.

Buildings and Breaker of the New Loomis Colliery

BY F. K. BREWSTER*

SYNOPSIS—The Delaware, Lackawanna & Western R.R. Co. is developing a new tract of virgin coal in the Susquehanna Valley. This article deals with the construction of colliery buildings and breaker, all of which are modern and erected with a view to permanence and fireproofness.

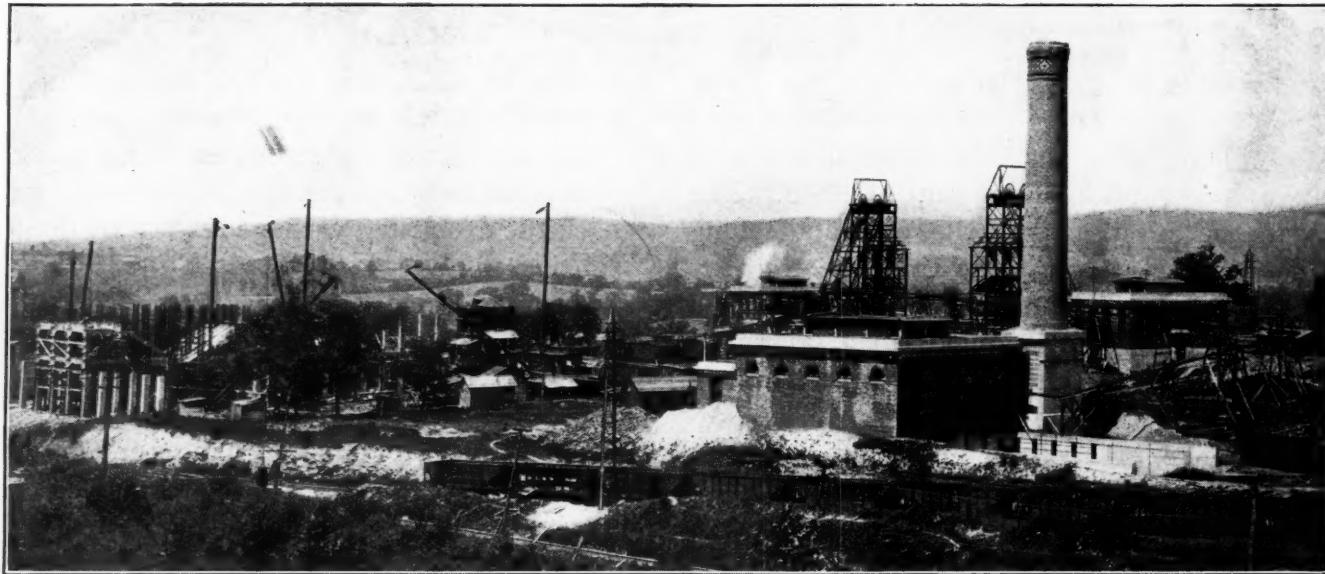
The Loomis Colliery of the Delaware, Lackawanna & Western R.R. Co. is located in Hanover Township, Luzerne County, Penn., about one mile from Nanticoke, on the east side of the Susquehanna River.

It is an extensive development on what was formerly known as the Dundee tract, and the Dundee shaft, which was first opened in the fifties but abandoned a few years

work is to be found. In two engine houses concrete girders 5 ft. in depth at the center by 47 ft. in length carry the roofs and ventilating monitors, while in the stable the roof girders are 39 ft. long.

A pleasing architectural feature of the buildings is the presence of decorative blocks of concrete set in the brick on the sides of windows and doors. Furthermore, diamond disks of concrete and brick have been placed between windows, which have also been designed large and with arched crowns for adequate lighting.

Soldier courses of brick on end, just above the foundation water tables, and also between windows and at the roof line, break the monotony of plain brick walls and add to the general appearance. The cornices of the larger



GENERAL VIEW OF SURFACE PLANT AT NEW LOOMIS COLLIERY,

later on account of gas, modern ventilating devices not being then available, is part of the new mine.

The Loomis tract adjoins three other mines of the Delaware, Lackawanna & Western, the Truesdale, Auchincloss and Avondale.

Two shafts have already been sunk to the Hillman vein, and the No. 1 slope has gone to No. 5 vein. No. 3 shaft is now being sunk, and thus the Loomis will be developed by four shafts and a slope, with perhaps an additional opening later. The development will extend over a long period of years.

The buildings of this colliery were designed primarily for permanence and fireproofness, but attractiveness of design has not been lost sight of. The result is at once pleasing to the eye and proof against time and the elements. The plans were drawn in the office of F. J. Nies, Delaware, Lackawanna & Western architect, Hoboken, N. J. Brick and concrete were employed throughout from foundation to roof, while considerable reinforced

buildings are of reinforced concrete, overhanging the walls, and provided with protective parapets above the roofs. These were poured at the same time as the slabs and girders, and are monolithic with them.

The group of buildings thus far consists of 14, in addition to the breaker and washery annex. These are the boiler house, three engine houses, a lamp house, a blacksmith and machine shop, an office and storehouse, an oil house, a fan house, an ice house, a lime and cement house, a stable, a wash house, and a powder house.

THE BOILER HOUSE IS CONVENIENT

The boiler house is a building 51 ft. 5 in. by 102 ft. 5 in. with basement, air duct and subways. Eighty feet of its length is used for the boiler room proper, which has three vertical-type boilers of 300 hp. each, built by the Erie City Iron Works. Directly in front of the boilers are the reinforced coal pockets, fed from the washery annex by a scraper line, with convenient bottom openings in front of the fire doors.

*1527 Gibson St., Scranton, Penn.

A temporary conveyor is now employed to feed the coal pockets. This will continue in use until the annex is put in operation.

The boilers and furnaces rest upon concrete foundations built to form ash hoppers and chutes to the subway. Fires are cleaned by dropping ashes through trap doors, just inside of the fire-doors into the hoppers beneath. From thence the ashes move by gravity through the chutes into ash cars in the subway. From here they are hauled by dinky locomotives to the dump. This avoids all accumulations of ash dirt on the main floor and all wheelbarrow work.

In the west end of the building are located the pumps and feed-water heater, while underneath the floor is the fan room with engines and fans for supplying forced draft through the air duct to the fires. Damper doors, with shafts, chains and levers enable the draft to be regulated by the firemen on the main floor.

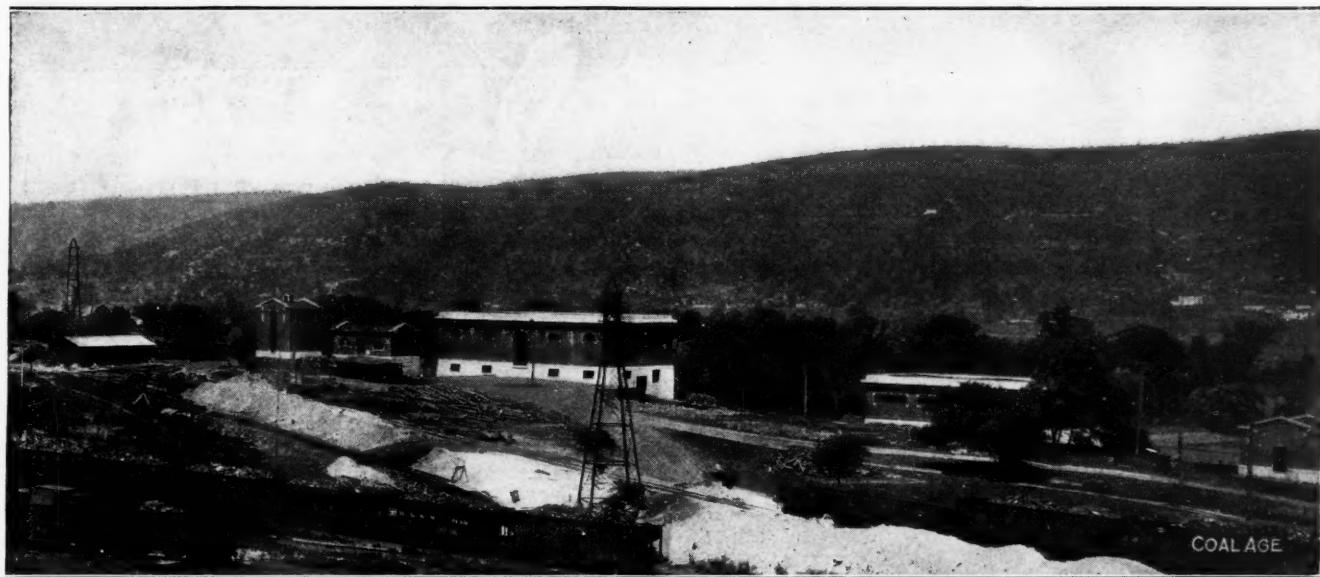
Provision has been made, both in the location and size of the stack, which is 12 ft. in diameter and 125 ft. high,

chine is equipped with powerful steam brakes and a Welch overwind preventer which, when a dangerous speed is attained, or when a cage goes too high, automatically shuts off the steam and applies the brakes. These hoisting engines were built by the Vulcan Iron Works.

The headframes of Nos. 1 and 2 shafts are of steel, 85 ft. high, and will eventually be equipped with automatic dumping cages, so that cars may be hoisted and coal dumped directly into the main receiving hopper midway between the shafts. This main hopper will also receive coal from Dundee shaft, No. 3 shaft, and No. 1 slope. A main conveyor will carry all coal thence to the top of the breaker, where it will be delivered to shaker screens and rolls for preparation.

THE STABLE IS WELL PLANNED AND SANITARY

The stable is a brick and reinforced-concrete building, in the basement of which double stalls provide room for 26 mules, while upstairs are a loft and granary. The



SHOWING POWER HOUSE, STEEL HEADFRAMES AND LARGE MULE BARN

for the extension of the building eastward and an increase in the number of boilers used, as the need develops for the same.

A locker room, with toilet, wash sink and shower bath for the comfort of the men employed completes the equipment.

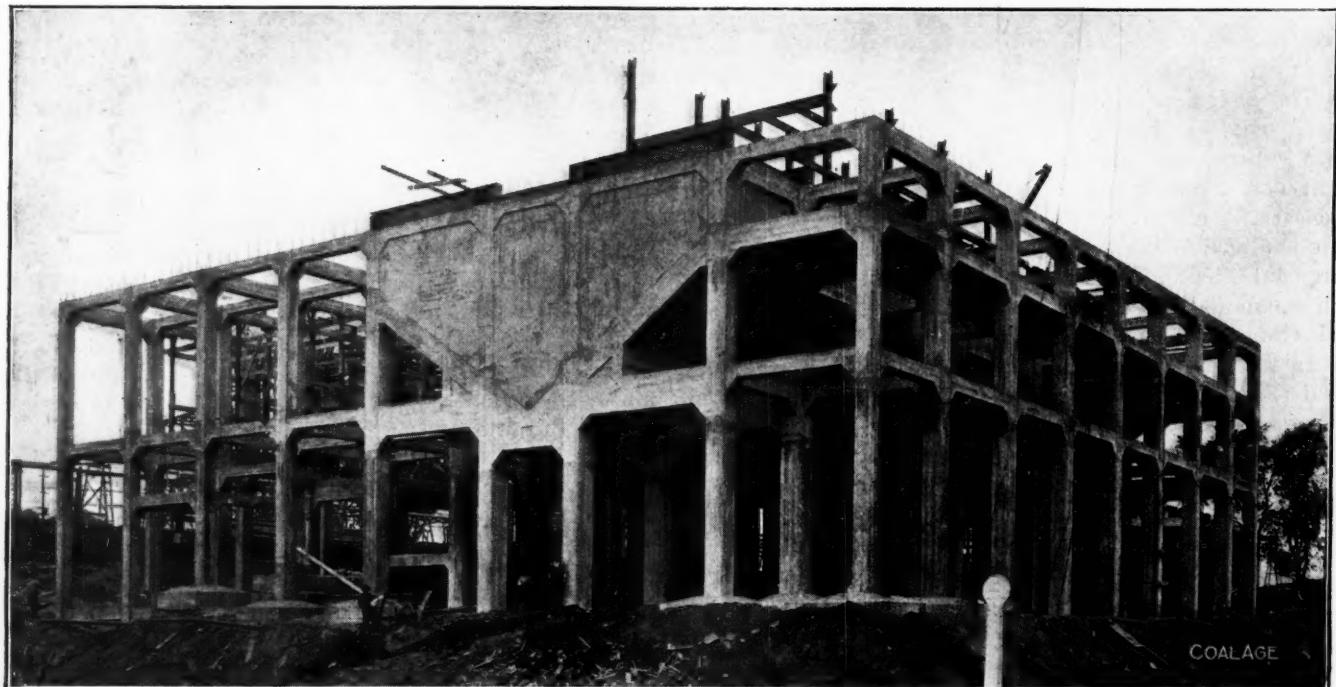
The boiler house, in common with the other buildings of the plant containing steam pipes, has a roof of hollow-tile blocks, with small concrete beams between, and a 2-in. slab of concrete over all, plastered with cement plaster on the under side. This treatment, it is believed, will reduce condensation and dripping to a minimum. A ventilating monitor with windows operated by chains from the main floor carries off gases and steam.

Engine houses Nos. 1 and 2, located about 100 ft. from Nos. 1 and 2 shafts, respectively, are identical in design, and conform to the general lines of the boiler house as to foundations, walls and roof. Both have hollow-tile roofs and monitors. They each contain 34x48-in. duplex simple Corliss engines, operating a 14-ft. double conical drum, each half having a rope capacity of 1500 ft. Each ma-

basement is well lighted, and the walls, floor, stall partitions, feed boxes and mangers are all of concrete. A middle passageway lengthwise of the building is used for distribution of hay and grain. This is wide enough to allow employees to avoid danger from vicious mules. The stalls are paved with cork bricks laid in sand on concrete and made tight with cement grout. This makes a comfortable standing and stamping place, which slopes slightly to the rear, where a concrete gutter affords ample drainage.

An added feature is the longitudinal ventilating flue placed just beneath the floor of the loft, with a vertical shaft to the roof at one end. This maintains good ventilation of the basement and greatly reduces the stable odors common to such places. The building is unusually dry, clean and warm. The cornice and roof are similar to those of the other large buildings, except that no tile were here used in roof construction.

The wash house, situated near the stable, deserves a better name than the colloquial "shifting shanty," for it is a good-sized building, adequately warmed and venti-



REINFORCED-CONCRETE PORTION OF LOOMIS BREAKER

lated and equipped with shower baths and lockers for hundreds of miners.

The storehouse and offices are in one building, near shaft No. 1. This has brickwork, roof and cornices similar to that of the other main buildings. Outside loading platforms at the elevation of box-car doors, the edges of platforms being protected with $6 \times 6 \times 3\frac{1}{8}$ -in. angles anchored to the concrete, are provided.

The remaining buildings of the group are smaller, have gable roofs and eaves, while cornices are placed at two ends only. The roofs of all buildings are covered with Johns-Manville asbestos built-up roofing applied to concrete slabs. Copper flashing was employed at all angles of cornices and monitors.

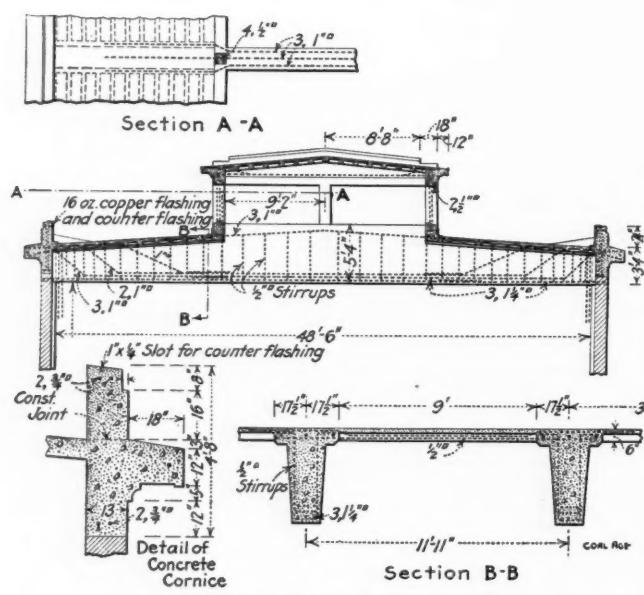
The concrete was mixed at one central mixing plant, and transported in side-dump cars by mule power to the different buildings. When roofs were being concreted it

was dumped into a hopper at ground level, thence into a bucket suspended from one end of a revolving T-arm at the top of a gin-pole, and when hoisted to the right elevation the T-arm revolved to a position so that the bucket could be dumped on the roof. As much as 85 yd. per day have been thus placed, with a comparatively small gang of laborers. W. H. Gahagan, of Brooklyn, was the general contractor for all these buildings, except the fan house.

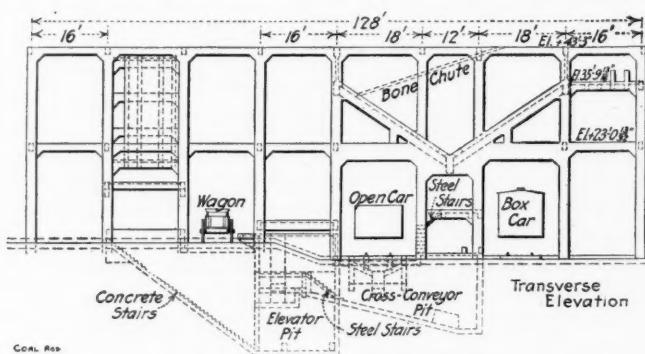
Concrete for foundations was mixed in the proportions of 1:3:5, and for roofs and all other reinforced work, 1:2:4.

THE BREAKER

The Loomis breaker, when completed, will be the most modern, best lighted and one of the largest owned by the Delaware, Lackawanna & Western R.R. Co. In construction, it is a combination of reinforced concrete and structural steel, and it is believed the result will be more satisfactory than the use of either material exclusively. The reinforced construction extends from the footings to the top of the coal pockets, an elevation of 43 ft. 3 in. above datum or track level at the center of the breaker. Above this the steel work is built up to a total height of



DETAILS OF ENGINE-HOUSE ROOF



LEVEL OF LOOMIS BREAKER CONCRETE BASE

169 ft. 4 in. above datum. The size of the breaker is 125 ft. 8 in. by 129 ft. 8 in. outside to outside of columns. It is designed to prepare 3500 to 4000 tons of coal per day, and will probably exceed that amount.

One of the most striking features of the breaker is the glass siding, consisting of Fenestra sash glazed with $\frac{1}{4}$ -in. wire glass, which totally incloses the structure and gives to it the distinction of being a "daylight breaker"—a new departure in Delaware, Lackawanna & Western design.

The reinforced portion of the building contains 2680 cu.yd. of concrete and over 500,000 lb. of reinforcement. Corrugated bars of 50,000 lb. elastic limit were used in beams and columns, and the American Steel & Wire Co.'s tri-mesh reinforcement was used in floors.

Eighty-nine concrete columns, varying in cross-section from 20 in. square to 36 in. square, carry the coal pockets and steel work above. These columns are joined together by two sets of tie-beams, 18 in. square, at mid-point and top, reinforced top and bottom. Furthermore, at all columns these beams have 18-in. corbels on lower side, insuring greater rigidity and greater shearing strength.

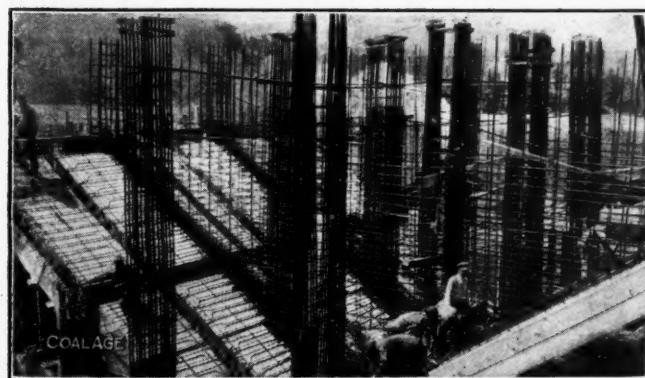
The column bars are hooped with $\frac{5}{16}$ -in. wire, spaced every 10 diameters of main bars. That is, if a column has 1-in. bars, the hoops are 10 in. apart. All column bar "cages" were framed on the ground and hoops wired to bars before placing in a vertical position. This method resulted in economy of time, rigidity of bars and greater ease of handling, derricks being used to erect and hold the parts in position while the splices were thoroughly wired. All splices are of 40 diameters length.

The percentage of reinforcement in columns normally varies from 1 per cent. to $1\frac{1}{2}$ per cent., and only exceeds the latter amount in the center columns of the coal pockets, where the size was restricted to give side clearance on loading tracks.

EXCAVATIONS WERE CARRIED TO SOLID ROCK

All excavation was carried to solid rock, in some cases as much as 32 ft. below ground surface, and the columns were built on top of reinforced footings properly doweled to receive the vertical rods of the columns.

A large elevator pit and a cross-conveyor pit, with reinforced walls, are sunk 20 ft. below datum, with hop-



SHOWING COAL POCKETS UNDER CONSTRUCTION

pers to receive lip screenings, condemned and bony coal which it may be found desirable to hoist to the top of the breaker for crushing and rescreening.

Transversely the breaker is divided into sections *A*, *B*, *C*, etc., to *I*; and longitudinally into bents 1, 2, 3, etc., to 9.

Two loading tracks pass under the pockets between bents 2 and 3 and 4 and 5, with a grade of 1.4 per cent. toward the loaded yard. In order to maintain uniform head clearance for cars, the main beams of the coal pockets are built to a similar grade. The apex of the pockets is between bents 3 and 4, and on either side are the openings in the pocket slabs from which cars are loaded.

There are ten pockets, two each for egg, stove, nut, grate and pea coal, with a total storage capacity of 3000 tons.

POCKET CONSTRUCTION

The main beams of the pockets are 18 in. by 3 ft. 11 in. in section, heavily reinforced with 1-in. bars and $\frac{3}{8}$ -in. stirrups. The partition walls are 8 in. thick, doubly reinforced horizontally from column to column, so that the filling of any pocket with coal, when the next one is empty, will be taken care of. The pocket slabs are 9 in. thick near the apex, and 8 in. thick above. They are reinforced with $\frac{5}{8}$ -in. rods, alternate rods being bent up over intermediate beams.

All pocket slabs will be covered with 3-in. plank, laid on sleepers and protected with a sheathing of malleable-iron plates. These plates not only cover the bottom, but are carried up the partition walls, to prevent the coal from wearing away the concrete.

Construction joints are normally in the center of beams, but in the longitudinal beams of the coal pockets it was found impossible to place joints at the center, owing to the junction of the sloping beams at that point. These joints were therefore offset 24 in. and special diagonal reinforcement was introduced to care for the shear stresses.

All columns were usually poured to the bottom of the corbels of the beams next above, and then allowed 24 hr. to set before these beams were poured. But in this matter also a discrimination was made in the case of columns on bents 2 and 5, which were allowed to stand for about two hours and were then completed to the top of the pocket slab, in order to make the job monolithic. No cracks have developed.

All concrete was machine mixed in proportions of 1:2:4, and no stone was used that could not pass a 1-in. ring. The stone was also required to pass a test of 90 per cent. insolubility in dilute hydrochloric acid as a precaution against the corrosive acids of mine water.



A NEAR VIEW OF COLUMNS AND BEAMS UNDER COAL POCKETS

Reiter, Curtis & Hill, of Philadelphia, had the contract for the concrete work.

The superstructure of the breaker is of steel, Bethlehem H-sections being used in columns, I-beams and channels for floors, and angles for diagonal bracing.

Mild steel is specified for the structural members and an allowable unit stress of 16,000 lb. in tension is called for. The columns are designed by the formula

$$p = 16,000 - \frac{70l}{r}$$

in which

p = Allowable compressive stress;

l = Length of column, and

r = Radius of gyration.

About 1000 tons of steel are employed in the structure. In addition steel towers and angle trusses carry the sloping main conveyor line from the coal-receiving hopper to the top of the breaker. This will be a 10x60-in. flight conveyor with two strands of 2-in. monoblock chain.

There are many floor levels in the steel work to facilitate operation, but all these will be concrete slabs on steel beams. No more wood than is absolutely necessary will be introduced. Protective railings and machinery housings will guard employees as much as possible. "Safety first" has been constantly in the minds of the planners.

The Guerber Engineering Co., of Bethlehem, has the contract for steel work. The breaker will not be ready for operation before the latter part of 1915.

The total cost of the breaker and all buildings will exceed a half million dollars.

Merging the Interests of Coal Exporters

The Latin-American Trade Committee, recently appointed by Secretary Redfield, has submitted a report, making suggestions and recommendations for furthering our export trade in South America.

After discussing financial questions, the suggestion is made that, instead of individual merchants and manufacturers maintaining individual representatives at considerable expense, associations be formed in each line of business that would send out one or more representatives to look after the interests of such associations. This seems to be a wise and practical suggestion and its consideration is recommended to coal operators and sales agencies.

The idea is not entirely new to Eastern coal men; it was taken up in 1911 by the president of a large Eastern, New River sales agency, and came near to being put in operation at that time, in regard to the New River coal field; but the plan failed owing to internal disagreements among those interested. The present would seem to be an excellent time to take up the matter again.

To illustrate, an association of Pennsylvania operators and sales agencies, having both steam and locomotive coals suitable for export, could maintain a consolidated foreign-sales agency at a small expense to each member. One man could be designated to look after the steam coals and another, the locomotive and gas coals, the maintenance expense to be divided in proportion to the output tonnage of the several companies merged.

I will not go into any of the details of such a plan, but its advantages may be broadly summarized as follows:

1. It would relieve the pressure on the domestic markets to take more coal than they actually need; or, in other

words, the plan would take care of any overproduction, which is fast becoming a vital question.

2. It would do away largely with the handling of coals by competitors or their business associates, something that has always been a detriment to coal and its sale.

3. It would result in maintaining better average prices for coal, as a natural result of securing wider markets and an increased demand.

4. By increasing the export of coal, it would help to throw the balance of trade in our favor.

5. It would give the mines steadier operation, which means reduced cost of operation.

6. It would also reduce the cost of selling the coal.

7. It would mean a greater development of the coal fields, and make easier the securing of capital for improvements and development.

8. It would bring about a closer business relationship between operators and agencies, and tend to stop price cutting.

9. It would enable the railroads to give better car service, by keeping a larger percentage of their equipment on their own lines, besides tending to reduce cost of transportation.

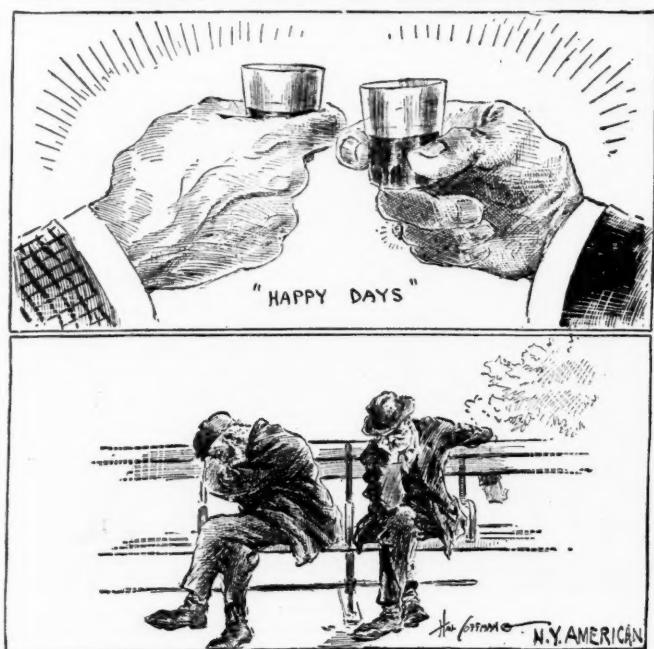
10. The members of such an association would obtain a wider knowledge of foreign-trade conditions, coals and transportation, and would learn the value of properly preparing and mining their coal.

11. It would have a tendency to reduce ocean freights, owing to the movement of a heavier tonnage and a steadier demand for ships, thus turning the currents of trade our way.

12. The question of foreign credits and banking facilities would be more easily handled.

Finally, it would assist this country in getting into closer touch with other countries, by learning to know other people, their needs and customs, a thing that cannot but broaden our influence in world politics, as well as make us better fitted to handle our own affairs. Coal operators, it is for you to say; let us have your criticisms. Why would not such a plan be both feasible and profitable?

A Toast and Its Realization



Colliery Lubrication

BY EDWIN M. CHANCE*

SYNOPSIS—*Oils of good quality can often be purchased on specification at a better price than can oil of lower quality by ordinary merchandizing. This is well known to the large buyers for export or domestic use, but not understood by the industrial purchasers. The best way to contract is for an oil similar to sample and not for one having simply certain physical characteristics.*

■

Colliery lubrication is the one problem connected with the production of coal upon which the progressive mine executive has probably the least accurate information. This condition has grown from two main causes—first, the apparent cost of lubrication is relatively small when compared with that of many of the other items combining to form the cost of the production of a ton of coal, and second, the great oil companies have systematically pursued a policy of silence and have rather fostered the belief that the science of lubrication is a sort of "Black Art" and that its deep mysteries can be fathomed only by the initiated.

If a careful inspection be made of the lubrication supplied to the average coal-mining company a rather unsatisfactory state of affairs will be found to obtain. It is probable that either oils of fair grade are supplied at an unreasonably high price or if the mine operator has succeeded in securing low prices from the oil companies the very dregs of the market will be found to have been foisted on him. And in some aggravated cases high prices are being paid for extremely low-grade products.

THE UNDISCRIMINATING MAY GET OILS FROM ASPHALTUM CRUDE

The reasons for these unsatisfactory conditions are not far to seek. In the first place the mine official coming into direct contact with the problem of lubrication is at a hopeless disadvantage, as an offhand inspection is his only means of judging the quality of the product supplied and moreover there is too often a tendency at the main office to consider lightly the complaint of the man in the field on this score.

The markets supplied by the great oil refiners can be divided into two classes, the first being the discriminating and technically controlled domestic and export trade. In this class and especially when the oil is purchased for export the quality of the product supplied is carefully controlled by a thorough technical examination. The second class is the domestic trade as typified by the coal-mining industry.

Now enormous quantities of asphalt-base crudes are refined annually, with the production of a great amount of relatively low-grade lubricant, while the production of high-grade Pennsylvania-type lubricating oil is relatively small. It is clear then that as these better-quality oils are most readily salable in the markets mentioned under the first classification, they will be but reluctantly supplied to the markets of the second type or if furnished to such markets will be sold at a price far above that at which they could be purchased if a full knowledge of the trade were brought to bear.

The question then arises, how can these conditions

be so met that a really high-grade lubricant, well adapted to meet colliery conditions, can be secured at a reasonable price? To this end, two things are essential: An accurate knowledge of the requirements of colliery machinery and an expert familiarity with the testing, refining and properties of lubricants. With this knowledge an intelligent opinion can be formed of the relative values of various oils for a given purpose, and by a system of competitive bids the purchasing agent can be assisted in securing the best and cheapest lubricants. This plan, however, entails a modified form of purchase based upon specification.

PREJUDICE AGAINST SPECIFICATIONS

Now the literature of the subject is filled with more or less violent attacks upon the system of purchasing oils under specification. These attacks generally take the form of quotations from contracts drawn by those who, not being thoroughly conversant with oil technology, have embodied glaring anomalies in their specifications. They are paraded before the oil consumer, and an attempt is made to deduce from such errors the fact that a specification is but an uncertain criterion of the quality of a lubricating oil.

Then too, the case is frequently cited in which an oil of a certain character has been specified for a given purpose. It is then shown that one radically different in nature would meet these conditions equally well. The inference is that this being true the specification is worthless. For example, we will assume that a Pennsylvania neutral with a gravity of 30.5 deg. and a viscosity of 200 has been specified for engine lubrication. It will then be shown by the critic that a paraffin oil with a gravity of 24 deg. and a viscosity of 300 will meet these conditions. Whereupon an attempt will be made to convince the consumer that, if two oils so different in constants will meet the same conditions, the specification must be of little value.

SPECIFICATION IS FOR OIL OF CERTAIN TYPE

Now the aim of a specification is not to describe every oil that will meet a given service, but to specify a certain oil which has been chosen for this work. Thus while the Pennsylvania neutral and the paraffin oil may both meet the conditions of the actual service in question, still, for reasons having weight with the chemist preparing the specifications, the Pennsylvania neutral oil was desired. If the paraffin oil had been wanted a specification would have been prepared that would require such an oil to meet its conditions. Thus the contention that a single specification will not cover all the oils that will give excellent service under a given condition is not valid.

In the ultimate analysis a specification is nothing more nor less than a scientific description and like any other description may be faulty, if the person making it is not familiar with the object described. To my mind a weakness in the preparation of oil specifications lies in the fact that they are given too much weight. Such specifications should be prepared solely for the guidance of the oil refiner in submitting samples and should be so prepared as to indicate accurately to him the nature of the oils desired.

*Consulting chemist and engineer, Wilkes-Barre, Penn.

By the guidance of specifications so drawn he will be in a position to supply samples of the products sought. When such samples have been received from a number of sources they can be submitted to a critical examination by a chemist and engineer thoroughly familiar with both the oil trade and the requirements of colliery lubrication, and the set of oils meeting the conditions best both in price and quality can be adopted.

SPECIFICATIONS REMADE SO AS TO PREVENT SUBSTITUTION

Upon the acceptance of such a set of oils, the samples themselves should automatically become the standard and should supplant the original specifications. In this way many of the real difficulties besetting the path of the intelligent purchaser of lubrication are removed. For example, we will assume that the specification originally called for a dynamo oil of 180 viscosity. There are a number of recognized instruments in general use for the determination of viscosity but we will consider here only the Tagliabué and Saybolt viscosimeters. Not only do these two instruments differ in their values for the same oil but those of the same make vary among themselves to a marked degree. Thus the refiner may submit an oil in good faith but because of the lower reading of the testing chemist's viscosimeter, this oil may not meet the viscosity requirements of the specification.

This oil, however, will probably compare favorably with the oils submitted by other refiners under the same specification. Suppose that the testing chemist finds the viscosity of this oil to be 165 as given by his viscosimeter. Now if the other oils submitted by refiners upon the specification of 180 average about 165, there is a strong presumption that the testing chemist's viscosimeter is reading 15 points too low. Assume then that this oil is accepted. It is clear that deliveries during the life of the contract giving a viscosity of 165, upon this viscosimeter, will be satisfactory.

Assume, however, that a complaint has arisen, a delivery has been condemned and the services of an outside testing laboratory have been secured. If the umpire chemist reports the same viscosity upon the condemned sample as upon the sample submitted with the bid there can be no question that the delivery should be accepted even though the actual figures may be in error. Thus samples of deliveries tested during the life of the contract can always be compared with the original oil, and in case of a dispute there can be no doubt whether the oil is of the same quality as the sample originally submitted.

DETERMINATIONS OF CHEMISTS DIFFER

It is only too true that the same oil when tested by different chemists will give decidedly different values. Hence, an oil may meet a given specification when tested by one chemist and may fail absolutely to pass the same specification when tested by another. If, however, we have a sample of the original oil for comparison these variations disappear to a large extent, as the question then involved is not whether the oil meets a given specification but whether it gives the same values as the sample originally submitted.

As a matter of fact a large proportion of the lubricating oils exported, and also of the oils supplied to jobbers in this country, are sold directly upon a rigid specification.

The refiner supplies the jobber or the foreign house with the values for the flash, fire, gravity, viscosity, etc., of his oils and the contract is awarded and deliveries made upon this basis. This fact, however, is scrupulously kept in the background by the before mentioned critics of such a method of selling lubricating oils.

COLLIERY NEEDS ARE PECULIAR

Another factor to be considered in securing efficient lubrication is the fact that the requirements of colliery machinery are different from those of the factory or general power plant. The oil trade has developed various classes of oils to meet general power-plant and industrial requirements, but these oils, unfortunately, do not always satisfy the more exacting demands of colliery machinery. For example, many of the steam-consuming units in and about the anthracite mines are supplied with steam by long pipe lines. The steam is thus very wet and frequently low in pressure when it reaches the cylinder. Hence, a different cylinder oil from that in general use is required to meet such conditions.

Another special use is that for pump-plunger lubrication. Many of the greases supplied for this purpose are worthless when used upon the plungers of mine pumps, for they are usually soap-thickened and decompose rapidly in the acid of the mine water, losing their consistency and at the same time their lubricating and protective value. Did space permit, the number of instances in which lubricants giving admirable service under normal power-plant conditions have proven themselves to be most inefficient at collieries could be considerably lengthened. Enough, however, has been stated to illustrate the point.

When we consider under what adverse conditions colliery machinery must function, the conclusion that the best obtainable lubricants are none too good becomes even more evident. For the first cost of these lubricants is lower than that of oils such as are usually supplied when the consumer throws himself upon the mercy of the oil company, and the saving in wear and tear, the increased amount of work that can be done, and the freedom from time-consuming stops are incalculably great when these high-grade oils are employed.

VALUE OF GOOD CAR OIL AND PUMP-PLUNGER GREASE

As an example, we might consider the question of car oil. It is true that a large proportion of this oil purchased by a coal company never reaches the car journal but is used principally to lubricate the road bed. For this reason it has been assumed that the cheapest possible oil should be purchased. This assumption might be correct were the cost of high-grade car oil excessive. This is not true, however, for an excellent Pennsylvania car oil can be secured at a very reasonable price.

When such an oil is used not only will the mules and mine motors be able to handle more cars to the trip, but the wear and tear on wheels and journals will be materially diminished. Moreover, it is an axiom that it is the tired mule that is injured and I have no doubt that in the long run the costly injuries to mules can be to a certain extent diminished by efficient car-wheel lubrication.

Pump-plunger grease has always been considered to be one of the materials for which it is unwise to pay a good price. As pointed out before, the usual grade of this

material is unsuited by its nature to withstand the service for which it is intended. Now the cost of repacking the water end of a large mine pump is so great that it would seem wise to do everything possible to make this work as infrequently necessary as possible. Fortunately, at a very small additional first cost it is possible to secure a pump-plunger grease which, being unaffected by the sulphuric acid and soluble sulphates of the mine water, meets the conditions admirably.

There are many oils upon the market, selling at from 50 to 75c. per gallon, which are supposed to possess certain marvelous properties, undetectable by the chemist and only to be observed with the eye of faith. These oils as a general rule are purchased by the proprietor of the brand or trade mark in question in bulk, from the refiner in the open market, and are usually standard products. They generally acquire their miraculous properties merely by the application of a gaudy label or brand and the expenditure of much money in advertising.

This type of lubricant for colliery use is most commonly seen among the compressor oils. I know of one such lubricant, dispensed by a large and reputable oil company under an attractive brand name at a high price. It is an acid-treated paraffin oil which when heated to a temperature of four or five hundred degrees Fahrenheit decomposes rapidly with the production of much tarry matter. This oil was used in the lubrication of a large new air-compressor installation with the result that the valves carbonized and stuck badly, seriously impairing the efficiency of the plant. Finally the air receiver exploded. Whether this accident was due to the compressor oil is open to conjecture.

It is too often the practice about the mines to use the ordinary engine oil in the compressor. This practice should be condemned, as a really good compressor oil can be obtained at a price but two or three cents above that of the engine oil.

The same principles apply to the purchase of cup and car-journal greases, and it is certain that the same or even greater economies can be secured in purchasing this as in the buying of lubricating oil.

These principles have been applied to the purchase of the lubricating oils and greases of a number of coal companies with a saving of from 25 to 35 per cent. in the first cost of lubrication and a still greater though not easily determined saving through the enormously increased efficiency of the lubrication secured. There has been another source of saving in addition to these two. With the high-grade lubricants, not only is the cost per gallon reduced, but the total number of gallons of oil used for any one purpose is cut down, as these high-grade oils, gallon for gallon, supply lubrication for a longer time than those which are inferior.

■

The Coal Miner

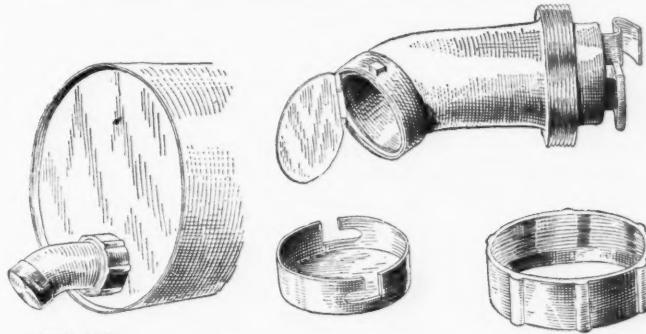
—He must work in gas and see in the dark,
The music he hears is the air drill's bark,
It isn't no picnic in the park,
It isn't no cinch he's stole!
He's carpenter, plumber, machinist, yes,
A sort of surveyor, too, I guess,
A little of everything more or less,
The miner who digs the coal!

—Berton Braley, in "Illustrated Sunday Magazine."

A Safety Powder Tube

The accompanying illustration shows an improved form of powder tube that can be quickly attached to the opening of an ordinary powder can or detached therefrom when not required. When attached to the can this tube serves not only the purpose of a spout by which the powder can be easily poured out of the can into a cartridge; but, at the same time, the tube forms a convenient handle for carrying the can and protects its contents from exposure to the air and from accidental ignition by sparks dropping into the can.

The tube is the invention of John H. Jones, of the Jones Manufacturing Co., Oakland City, Ind., who has recently patented the device, which is now on the market. The illustration makes clear the operation of the tube, which is secured to the powder can by two lugs. One of these lugs forms a fixed projection on one side of the tube, while the other is attached to a spring that enables it to be snapped or sprung into the opening of the can.



SHOWING SAFETY TUBE ATTACHED TO POWDER CAN AND THE DETACHED PARTS

The fixed lug is first inserted into the hole in the can, after which the other is sprung into place by a gentle pressure.

When the lugs are in place, the tube is firmly secured to the can by screwing down the coupling, as when tightening a union joint. For the purpose of detaching the spout from the can, a small opening is left underneath this coupling and immediately over the spring that secures the spout to the can. To detach the tube, the coupling is unscrewed and a nail or other small instrument is used to push back the spring while the spout is withdrawn from the can.

A hinged lid closes the mouth of the tube and protects the contents of the can from the danger of sparks dropping into it. A screw cap, shown in the illustration, is also provided and fits over the mouth of the tube when the can is not in use. This tube is made out of composition metal that resists the action of the mine air and corrosion by dampness. It will last a lifetime and is claimed to save a miner enough powder in six months to equal double the price of the tube. The device is simple, cheap and lasting. It supplies a long-felt want in coal mining. The security furnished by the tube against possible accident in the handling of powder when filling a cartridge, is well worth the price of one dollar asked for the tube. As a practical means of preventing such accidents to miners at the face, it should appeal to all operators, superintendents and mine foremen, who should urge its general adoption by all miners in their employ.

West Virginia Coal Exhibit at Panama Exposition

The coal-mining industry of West Virginia will be well represented at the Panama Exposition in San Francisco next year, and arrangements to make the exhibit as attractive as possible are now under way in the smokeless fields. Several thousand feet of moving-picture films have recently been made in the Pocahontas field, which will represent one of the greatest subjects of the kind ever produced. The mining operations will be shown in varied and interesting forms, as well as demonstrations of life-saving crews, pictures of outcropping seams of coal, panoramic views, etc., the whole reproducing life motion pictures of the production of coal in this great field.

Then the Norfolk & Western R.R. officials have arranged to picture the shipment of coal over their lines from the mines to the seaboard, the loading of the coal in sea-going vessels at Lambert's Point, and the vessels laden with West Virginia coal putting out to sea. It is the intention also to have a film showing vessels laden with West Virginia coal entering and passing through portions of the Panama Canal. At the Exposition these pictures will be shown each day in connection with the state's coal exhibit.

It is expected that this exhibit at the Exposition will have the effect of advertising the coal industry of West Virginia on the Pacific Coast and establish a permanent business through the Panama Canal with that section.

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The Cost of Anthracite Mining

If the preparing of anthracite for market after it is mined were conducted as a separate industry, it would require a capitalization of at least \$100,000,000. The entire capital invested in anthracite mining in 1909 was \$246,700,000, according to the returns of the Bureau of the Census, but that many of the companies are underecapitalized is shown by the fact that the value of the output in 1911 was \$175,189,392 and in 1912 it was \$177,622,626. The total value of Pennsylvania anthracite produced in 1909 was \$148,957,894, and the total gross expenses of anthracite mining that year were \$139,110,444. Fully twenty per cent. of the cost of mining and preparing coal comes after it enters the breaker above ground.

There are about 300 of these breakers in the anthracite region of Pennsylvania, and their average cost is \$200,000. Some of the larger and more elaborate ones of steel and concrete cost \$300,000, \$400,000 and even \$500,000. Their chief function, in contradistinction to their name, is to keep from breaking the coal into small sizes, because the larger sizes are more desirable. The coal bill alone for the steam plants of these breakers would amount to over \$10,000,000 a year, as it is now necessary to burn over 12 per cent. of the anthracite mined in order to run them.

DEPRECIATION COSTS ARE ENORMOUS

The depreciation costs in anthracite preparation, if it were separated from actual mining, would be enormous. The life of a wooden breaker, especially where water is used, is from eight to ten years, at the end of which time the repairs have been so many that it is an entirely new structure. The action of the water which, in the

anthracite region, contains a large proportion of sulphur, eats away the iron of the machinery in a year or two, so that it has to be replaced.

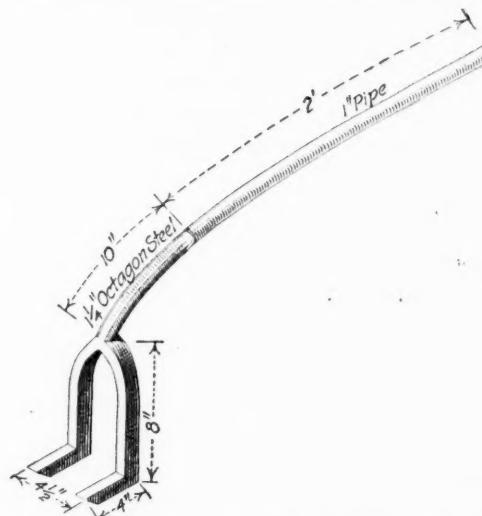
The machinery in breakers is subject to severe and heavy shocks, to excessive wear, to vibration and to the action of the sulphur water mentioned above. In wooden breakers, shafting and drives get out of alignment through the uneven settlement of the timbers, bringing tremendous strains on the machinery and increasing the amount of power required to drive it. Many of the wooden breakers have caught fire and burned to the ground in the last twenty years, causing a direct loss of \$100,000 to \$200,000 and eliminating the possibility of profit for many months thereafter.

As a separate industry, in fact, it would be difficult to make the preparation of anthracite pay, and it would be necessary to allow a wide margin of profit. And yet this industry is at the present time an integral part of the anthracite mine operators' efforts to prepare their coal for market, sorted into the standard sizes and ready to burn, and to secure a fair price for it. This supposition concerning the manufacture of anthracite as a separate industry may throw some light on the wholesale price of anthracite and why it has been necessary to increase it slightly on two occasions in the last ten years to meet increases in taxation and wages.

X

Rail and Tie Holder

In laying or repairing mine tracks, it is not always possible to have the rails resting upon all the ties before spiking, due to the unevenness of drift and crosscut floors, says the *Engineering & Mining Journal* in its issue of Oct. 31, 1914. To overcome the difficulty of spiking under such conditions, the tool shown in the accompanying illustration was devised. One end of a 2-ft. length of 1 1/4-in.



LEVER FORK FOR HOLDING TIE TO RAIL

octagon drill steel was split for 1 ft. and shaped into a fork, the end of each prong for a length of 4 in. being bent forward at a right angle; the other end of the drill steel was drawn out so that it would just slip into a piece of 1-in. pipe; this pipe serves as a handle and lever. By placing the fork over a rail and slipping the prongs under a tie, the latter may be held up firmly against the rail while being spiked.

The Labor Situation

The tobacco-raisers' night-riding in Kentucky seems to have induced a similar form of violence among the miners in the west of the state, in that important center of mining—Muhlenberg and Hopkins Counties. Henry Allen, who had taken part in the night-riding, was under indictment. It was believed that he would confess or had confessed, so the night-riders lynched him. These men term themselves the "Possum Hunters," and their violence is directed at those who hire negroes or nonunion men. They have murdered men and boys, beaten women and fired houses. Helpless negroes have been dragged from their houses at night, tied to trees and beaten almost to death with rawhide whips and switches.

Citizens Arm Themselves Against "Possum Hunters"

The citizens of Earlington, Madisonville and Carbondale, like the operators of Colorado, have been compelled to form civic guards. At the first mentioned town, a blockhouse has been built and provisioned. A guard is kept in this, night and day.

About three weeks ago, a band of at least a hundred men invaded the village of Carbondale in the small hours of the night and shot up the town, killing an 11-year-old negro boy and riddling several houses with bullets. The parents found the dead boy after the marauders left. The federal troops are expected and, indeed, seem sorely needed.

Attempted Organization of Fairmont District

An attempt is being made to organize the Fairmont district of West Virginia. It was hardly anticipated that this section would be singled out for attack as its competition had not been felt in the union districts. It had been quite openly stated that Logan County would be the next center of labor trouble, but it appears that Fairmont is selected.

The alleged wrong to be redressed is the payment by car instead of by weight, while the main concession sought is the union check-off. There are 25,000 miners in the region, most of whom are employed by The Consolidation Coal Co. Thomas Haggerty addressed a meeting urging union activity at Flemington, W. Va., on Nov. 13. On the 16th he is due in Philadelphia for a three-day session of the international executive board.

Coshocton District of Ohio Is Still on Strike

The miners in the Coshocton district of Ohio have just refused to accept the recommendations of the joint scale committee as formulated early in the past week, the vote being 265 to 220. W. H. Hawkins, the head of the operators' organization, has declared that all the propositions of the operators are withdrawn. President Thompson, of the miners' organization, declares that the miners are willing to permit their proposition to stand, and that they will sign a contract on that basis with any operators who will accept it. The joint-scale convention adjourned sine die on Nov. 13. Thus all the miners in the district will remain idle, except those at the Davis mines in Conesville and at the Tyrone mines, which have been operating for some time.

The bone of contention was not the scale proper, as the mining rate was acceptable to both parties. The difference arose over the pushing of cars from the neck of the room to the face and out again when loaded. The men are unwilling to perform this service.

Eastern Ohio Operators Look to West Virginia

In the eastern Ohio district, the expected conference of operators and miners failed to materialize. The long-drawn-out strike continues, and the operators seem disposed to buy coal lands in West Virginia, where such severely restricting obstacles to profitable mining do not exist.

The Discharge of a Pit Committee in Kansas

It was thought that when the miners of districts 14, 25 and 21 met in Kansas City, in September, and ratified the new joint interstate agreement, there would be no more trouble. However, the usual dissensions have again sprung up. The discharge of three members of the pit committee of the Cherokee & Pittsburgh Coal & Mining Co., located at Pittsburg, Kan., is the most recent cause of dissension. The men demand that the discharged officials be allowed to return to work. This strike affects about 2000 men, all of whom walked out, after cleaning up, taking their tools with them. The company is willing to put the matter before a board of arbitration as laid down in the agreement; however, the miners refuse to do this. A section of the agreement anticipates such a situation, and provides that during the settlement of disputes the men shall continue to work. The section reads:

If the president of the district, or his representative, and the commissioner of the Operators' Association, or his representative, fail to agree, they must either submit the matter to arbitration or refer the case in dispute and the records in connection therewith to the District Joint Board of Miners

and Operators for final settlement. Pending the settlement of any dispute, the mine shall continue operation, and all miners, mine laborers and parties involved shall remain at work, except discharged employees.

Explanatory Note—What is meant by final settlement is that the district joint board shall dispose of all grievances referred to it without strike or stoppage of work.

Under this provision the strikers are said to lay themselves liable to a fine of one dollar a day for every day that they are out, since they refuse to return to work pending the settlement of the dispute.

Meeting of the American Federation of Labor

The American Federation of Labor has been meeting in Philadelphia, Penn., and there Mother Jones delivered one of her soul-stirring harangues. If the press is to be credited—and the words sound like hers—she now claims she was at Ludlow when the camp was burned. The principal resolutions from a coal-mining view were those desiring the abolition of efficiency systems by which workmen are speeded in their work, the introduction of legislation placing a minimum of 66 $\frac{2}{3}$ per cent. of the wages paid any man as the rate to be paid relatives of men killed at their employment, and requiring that compensation be paid to children of miners who are accidentally killed till these dependents reach the age of 18.

The Federation also resolved that workmen's compensation laws should be administered by state commissions, and that employers' liability insurance be eliminated from the scheme of workmen's compensation. An excellent resolution to do away with discrimination in favor of unmarried and childless men advocated the passing of laws making the state the beneficiary where men were killed who had no dependents. However, this would not work any benefit where the state is itself the insurer of the workman.

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Coming Meetings

The American Society of Mechanical Engineers will hold its annual meeting in New York City, Dec. 1, 2, 3 and 4, 1914. Calvin W. Rice, secretary, New York City.

The American Mining Congress' seventeenth annual session will be held at Phoenix, Ariz., Dec. 7, 8, 9, 10 and 11, 1914. J. F. Callbreath, secretary, Denver, Colo.

The Coal Mining Institute of America will hold its winter meeting Dec. 8 and 9, 1914, at the Fort Pitt Hotel, Pittsburgh, Penn. Charles L. Fay, secretary-treasurer, Wilkes-Barre, Penn.

The West Virginia Coal Mining Institute's winter meeting will be held at Huntington, W. Va., Dec. 9 and 10, 1914. Prof. E. N. Zern, secretary-treasurer, Morgantown, W. Va.

The American Institute of Mining Engineers will hold its annual meeting in New York City, beginning Feb. 16, 1915. Bradley Stoughton, secretary, New York City.

The Kentucky Mining Institute's winter meeting will be held Dec. 4 and 5, 1914, at the Seelbach Hotel, Louisville, Ky. Ivan P. Tashof, secretary-treasurer, Lexington, Ky.

X

Extracts from a Superintendent's Diary

One of our mine foremen is a born diplomat. If there were only a sufficient number of his type in the business, the trials of mine superintendents wouldn't be worth considering.

If he finds that he is accumulating too much narrow work, he sounds a few of the heading men and soon has them dissatisfied with narrow work and clamoring for rooms. Perhaps in a few months the conditions will be reversed and he is more than apt to have some of these same men suggesting their disappointment with room work and requesting a change back to narrow work.

Our coal varies in thickness considerably in different parts of the mine. Some miners prefer thick coal and others thin; when conditions change in a room after a miner has chosen the room, following careful investigation, as a rule he becomes discontented and begins to grumble. Mr. Diplomat makes short work of such grumblings. The miner who prefers thick coal to thin, after a short talk with this foreman becomes convinced that his preference is not well grounded and the advantage, if ad-

vantage there be, is in favor of the thin coal. And in quite the same manner the miner who prefers thin coal goes away pleased with the place in which he is working.

Then there is the constant variation in the proportion of working places in rooms and pillars. The Diplomat never quarrels with engineers' orders; if it becomes necessary to stop one hundred pillars on one day's notice, he promptly orders them stopped. His men, who declare that they will leave the camp rather than go into rooms, find themselves working in rooms in a few days, and well satisfied at that.

But the supreme test of this man's ability to handle men has just been completed and I doubt very much if he realizes that he has accomplished anything unusual.

At his mine we had always used the entire output of coal for coking purposes. The seam of coal being rather dirty, it has been necessary to crush the coal and then treat it in a washer before sending it to the ovens. If the miners became careless about separating the impurities before loading their mine cars, the waste at the washer would begin to climb, but some variation now and then was always expected and no noticeable shakeup would follow.

Last month, however, conditions became such in the coke trade that it was necessary to discontinue coking operations and the entire output of the mine was thrown on the market as run-of-mine steam coal.

Now steam-coal users are always on the lookout for cars that have a sufficient amount of bone and slate to attract attention, and we almost had our entire contract canceled before we got our bearings.

Then we got busy and found that it would be necessary to change the grade of explosive used, also modify the system of mining. And this was not all; even with all these changes the miners would have to be extremely careful or the coal could not be properly cleaned.

Miners do not take kindly to changes of any sort, and I assumed that they would not meet our views without cutting up considerably.

They did meet our views, however, and they didn't show their teeth.

Truth is, our foreman put the proposition before them in such a way that they followed his wishes without realizing that they were being asked to do anything unusual. And the foreman in turn didn't seem to realize that he was doing anything unusual himself.

The Pacifier

WHEN I comes home from work at night
All tired out from minin' coal
An' black an' sweaty to the sight
I ain't th' gladdest kind of soul;
Th' world don't make no hit with me,
I'm mighty weary with my lot,
An' every bloomin' thing I see
Just seems to feed th' grouch I've got.



THE World Don't Make No Hit with Me.

I CUSSES at my daily work,
I damns the Pitboss to th' Pit,
I thinks of all th' dust an' murk
Of minin'—an' I cusses it;
I thinks, "Us miners ain't no men,
We're pore dumb beasts that's hitched an' drove;
I starts once more to swear—an' then
I smells th' supper on th' stove!

*Written Expressly
for COAL AGE* By BERTON BRALEY

IT mebbe ain't so very much
(A miner ain't no millionaire)
But when I seents that stew an' such
I—well, I half forgets to swear;
From worries an' from troubles, too,
My thoughts begin to stray an' rove,
An' life assumes a dif'runt hue,
When I smells supper on th' stove!



THEN I Smells the Supper on the Stove.

AN' when they brings that supper in
An' wife an' kids an' me sets down,
I finds a sort of pleasant grin
Has chased away my ugly frown;
I puts away all thought of strife,
My appetite I gives the call,
An' thinks, "Oh, well, this miner's life
Ain't nothin' awful, after all!"

Power Department

Coal Waste in Mining Plants

BY HENRY D. JACKSON

SYNOPSIS—In extremely few mining plants are means provided for keeping track of the quantity of water fed to the boilers or the coal that is burned under them. The carelessness prevalent in such plants makes the proposition offered by the central power stations appear extremely attractive.

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It seems somewhat like "carrying coals to Newcastle" to suggest to men in the coal-mining industry that they had better take more care in their use of fuel, if they have any interest in cutting the cost of mining, also if they care to prevent being compelled sooner or later to purchase current from the power companies which are fast springing up throughout the coal fields and whose sole reason for existence is the wasteful use of fuel by the people who mine it.

This may appear like a strong statement, but the facts justify it. How many coal plants are provided with any means for weighing the coal used under their boilers? How many are provided with meters or any apparatus for measuring the water fed to their boilers? In other words, how many of them have any idea of the actual amount of water evaporated per pound of coal?

Perhaps it is quite natural that this condition should have existed in the old days when the range between the price of coal as mined and sold was fairly large; but today, when the competition is keen and the margin of profit small, it cannot be said to be good business to have the costs run any higher than they must.

In the East where coal costs in the neighborhood of \$4 per ton (the same fuel that is used by many of the coal producers as it comes from their mines), many plants not over 100 hp. in size manage to produce power at a cost of not over 2 cents per horsepower-hour, including all charges. And of this cost the coal represents in the vicinity of 60 per cent.

This means that the coal cost is about 1.2 cents per horsepower-hour. As coal at the mines has a value of about \$1, the expenditure for fuel on the same basis of costs would be one-quarter of that in the East, or 0.3 cent; and if the rest of the expenses were in proportion to those in the East, the total outlay for power would be about 1.1 cents. Since the taxes are lower as are also wages, it should be found that even in the smallest coal plants the cost of power should not exceed 1 cent, and should run much lower in the larger ones, especially in those which have to operate in part at night, as the stand-by losses which exist in manufacturing plants would not then occur.

In the larger and better equipped and better managed plants in the East, even better results are possible than those above named; and it is by no means an uncommon thing to find them getting a horsepower-hour for about 1 cent. This being the case, the plants in the coal

region should be able to better these figures as coal is there cheap.

That this is not the case, is shown conclusively when many colliery managers are willing to pay over 1 cent per kilowatt-hour to the power companies for current, in addition to the fixed charges on the machinery to use the same, as well as to scrap their present plants or to hold them and continue to pay the interest charges on the old investment. This latter point is one that is frequently lost sight of when power is purchased—that is, the owner forgets that his original investment is still there and eating up the dividends.

WHY IS POWER BEING PURCHASED?

In the light of what is shown above, why is it that the coal companies are coming to purchase power, if it is not due to their waste of coal or inefficient operation of their plants?

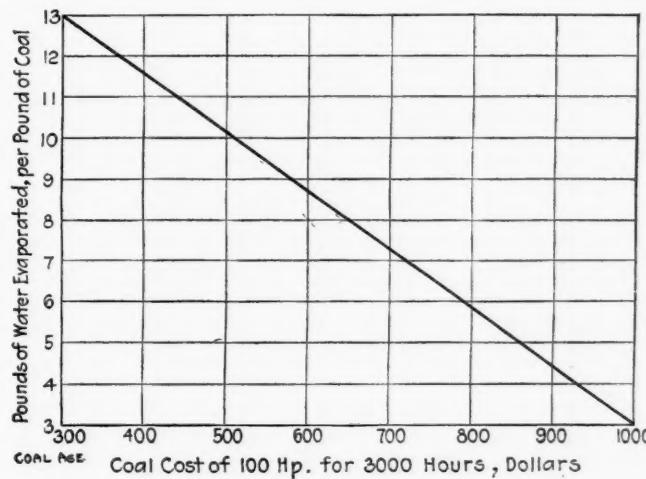


FIG. 1. COST OF POWER WITH VARYING RATES OF EVAPORATION

The very fact that coal has a value of but 80 cents to \$1 a ton, is one answer. For why spend the money necessary to secure efficient engines and good boilers or feed water heaters or purifiers, or in fact any of the devices to save coal; also why do everything to find out how much coal is burned or how much water is evaporated, if the resultant saving will in any case be small? That this is a mistaken idea, it is my intention to prove, and I hope to be able to show it so conclusively that every plant will take steps to ascertain what it is doing, and if the results are not what they should be, take further steps to find out why and make the corrections required.

In a good boiler, clean and well handled, it is possible to evaporate about 12 lb. of water per pound of coal, the latter possessing a heat content of about 14,000 B.t.u. This presupposes that the fuel is well fired and that the boiler setting is adapted to the coal, for much of the success in burning fuel depends on the proper setting as well as firing. In fact, quite as much heat is wasted

through improper settings as through poor firing, and these two are responsible for the greater part of the waste of coal.

The other waste points are cold water and dirty boilers. Few people who have not spent considerable time in the study of power plants, realize to what an extent waste can develop without its being actually noticed. Neither do they realize that even a small amount of scale or soot or both seriously affect boiler performance, while the effect of heating the feed water is to them but little more than conjecture. All of these items are of as much importance in a plant where the coal costs little, as where it costs much, for they in turn seriously influence the cost of coal, and, therefore, the price at which it may be sold at a profit.

The feed-water heater will effect a saving in fuel of 1 per cent. for each 10 deg. rise in feed temperature. Figure this out for your plant. If the average temperature of your feed water as it comes from the mains or supply, is 60 deg. F. and you can raise it to 200 deg. by the heat left in the exhaust steam, you have added 140 deg., and by the rule given, you will have decreased the coal needed 14 per cent. besides saving the boilers from dangerous and injurious expansional stresses.

Boilers which are dirty, either inside from scale or outside from soot, are equally wasteful, so that care should be taken to avoid the use of water carrying scale-forming material, either by careful selection of the source or by purifying the water before it enters the boiler.

The use of boiler compounds is, generally speaking, not to be recommended, as this is only treating the disease after it has gotten into the system. The better way is not to allow the disease to enter, by removing the impurities before the water gets into the boiler. Such treatment costs but little and may save much trouble, besides saving considerable in coal, as a very thin layer of scale will reduce the evaporation by a large amount. The same applies to soot. Keep it away from the heating surface or its cost in wasted coal will be large.

DETAILS ARE IMPORTANT

It is only by attention to details that the cost of coal and power can be reduced to a minimum and kept there. But is that attention not justified when the results will pay handsomely? When everything has been done to secure good results, there is no reason why the evaporation should not be in the neighborhood of 12 lb. of water per pound of good coal; with lack of attention and even where care is taken, unless there is some device for weighing the coal and for measuring the water, it will be found that the evaporation is by no means where it should be, so that the very first things required for results are those which will indicate to the owner what is going on in the plant.

It would be impossible in these days of close competition, for a coal operator to guess at what his coal costs and sell it on that basis. He knows pretty exactly what each ton costs and what he must get for it in order to make a profit. To do this, he must know what each step costs and take into account every detail of the work.

The power costs are lumped, and unfortunately in many cases the entire services of the master mechanic and electrician are charged against the station, when much of their time is spent in following up work in no sense connected with the cost of making power. In jus-

tice to the plant, such services should be charged up to repairs, maintenance, or wherever they belong, and not to power cost. Then when the power companies attempt to sell current, some real figures will be at hand to compare with those they offer.

It is safe to say that any plant having 500 horsepower in boilers and having use for that amount of steam, with engines of any good make and with the plant operated with any real attention to economy, can produce its own power cheaper than it can buy it, and this without taking into account the fixed charges on the new apparatus that will have to be secured in order to make use of the power when purchased. It must not be lost to sight that the lines of the power company have to run over long distances and are subject to many disturbing factors, any one of which may mean a shut-down to the coal mine, also that the contracts are frequently so worded that there is no redress in case of such suspension.

CENTRAL-STATION COST IS NOT THE ENTIRE COST

The claim that owing to their size these power companies can produce current at a lower price, may be true, but the cost of power at the central station is not the cost that counts. To this must be added the fixed charges on the lines to transmit the power, also the cost of the power lost in transmission, and in transformation, as well as the expense of the business department for obtaining the business and collecting the money for the power sold.

When this is added to the cost of current at the plant, the total cost of the power must be from two to six times the station cost. Take this into account and consider, "Is it possible that we, without all of these costs to add to our operating expense, cannot produce power at least as low as we can buy it?" If not, why not? And then get busy.

For every 100 hp. of boiler plant, the coal consumption should not exceed 2.7 lb. per horsepower-hour, or 270 lb. with the boilers in good condition and everything about the plant in shape for economy. This means an evaporation of about 12 lb. If things are not kept up, the evaporation may fall as low as 5 lb., which is by no means unknown, and the coal required per horsepower-hour may increase to 6.4 lb., or 640 lb. per 100 hp.-hr., and according to the conditions it may vary anywhere between these limits.

For every 3000 hours' operation of the plant, the coal may vary between the low limit of 810,000 lb. and the high limit of 1,920,000 lb. With coal costing \$1 per long ton, the variation will be from \$361.60 to \$861.10, the difference representing the interest at 6 per cent. on an investment of \$8325, or more than the entire cost of a fairly high-class plant.

Considering these facts, is it not worth while taking steps to ascertain what you are doing, and to maintain your plant in the very best possible condition in spite of the low cost of coal, for, after all, this expense for fuel is an important factor in the cost of coal mining and the saving made in it may go a long way toward paying a dividend on your plant.

There are but few coal operations where the boiler plant is smaller than 200 hp., and the majority are much larger. A 200-hp. plant would show a range of double the above figures, and so on, according to the size of the plant. The cost of 100 boiler-horsepower for 3000 hours, with coal

at \$1 per ton of 2240 lb., at varying rates of evaporation, is shown in the accompanying curve.

At 12 lb. evaporation, the cost would be approximately \$361. At 3 lb. evaporation, the cost is approximately \$1000. This is a graphic illustration of the value of knowing what is going on in your boiler plant, for of all places this is the one where the greatest loss can occur without its being apparent, unless the plant is equipped to keep track of the evaporation, which means weighing the coal and measuring the water.

RECORDS MUST BE KEPT

Results cannot be obtained by letting things go, even with the best of plants, but records must be kept on file showing at all times just what is being done. Not only the quantity of coal and of water must be known, but the feed water must be maintained at high temperature, the boilers kept clean both inside and out, and last of all, the methods of firing must be closely watched so as to see that fuel is not wasted at this point, for more coal can be lost through poor firing than by dirty boilers or cold feed water.

Another point well worthy of consideration is the type of boiler setting employed, for no type of setting is adapted to all kinds of coal. In fact, each character of fuel should have a setting specially adapted to it, as each coal varies so widely in its constituents, that the amount of air re-

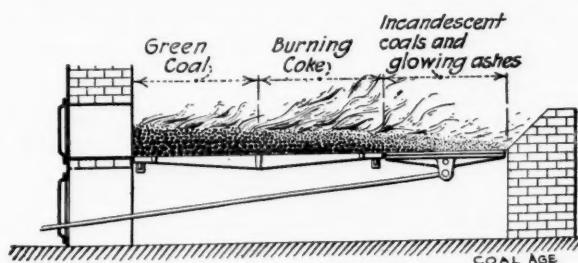


FIG. 2. THE PROPER CONDITION OF THE FIRE

quired, as well as the height of the boiler above the grate, will vary for good results. High-volatile coal requires a setting with a considerable distance between grate and boiler, and grate bars having big air spaces, also in all probability a large air opening in the fire door so as to allow an excess of air over the fire, in order to properly burn the volatile matter and possibly the fixed carbon.

Other coals with less volatile will require the grates close to the boiler and fine air spaces, as well as no extra air over the fire, so that for the best results the boilers should be bought and installed with due consideration of the coal to be used.

The average boiler employed throughout the coal region is the horizontal return tubular. This boiler was originally designed for the use of anthracite coal. When modified for the use of bituminous coal, the grates were lowered somewhat. They were not, however, lowered enough for most characters of bituminous or semi-bituminous coal, nor were they adapted to these fuels in many other ways, such as the location and arrangement of the bridge-wall or for the supplying of air over the grates. Furthermore, little attention has been paid to the proper methods of firing for economical results.

Most engineers are aware of the great saving in fuel made by the under-fed type of stokers, but not all are

cognizant of the reason for this economy. In the first place, the coal is fed upward to the fire. All of the gases are distilled off, mixed with air also coming through the bed of coal, and passing through the incandescent fuel above, are ignited and consumed, thus utilizing all of the volatile matter which is capable of being burned.

As most of these stokers operate under forced draft, it is quite possible to supply the exact amount of air necessary to burn not only the gases, but also all of the fixed carbon in the coal. This is almost impossible of accomplishment by hand firing with the present arrangement of settings.

It is also to be noted that the larger number of under-fed stokers have the bed of the fire much farther away from the boiler than is the case in the ordinary setting. This also assists in a thorough burning of all the gases, because the latter do not get into contact with the shell of the boiler before ignition.

THE USUAL RESULTS OF HAND FIRING

With hand firing, coal is distributed over the fire, the gases are distilled off, rise, strike the boiler, are chilled below their point of ignition and are driven off unconsumed, carrying with them a considerable proportion of unburned carbon in the form of dust. That this is poor economy, has been shown again and again by different types of so called smoke consumers, which do nothing more than properly mix air with these gases and force them over a bed of incandescent coal. The same results could undoubtedly have been obtained by raising the boilers considerably above their present height, and firing properly.

The use of dumping grates, making the last third the dumping portion, would also serve to assist, as by this means cleaning the fire would not mean opening up the entire grate. This last third could always be kept covered with live, full-burning coal, while that on the forward section of the grate would be in process of coking and partially burned. The general condition of such a fire is represented in the accompanying drawing, which shows the first section of new coal, the second partially burned, and the third section of incandescent coal and ashes.

When this third section is burned out, it is dumped; the second section is pushed back to take its place, the first takes the place of the second, and the first is renewed. By doing this under one-half of the boiler at a time, the most economical results can be obtained. Not only this, but the fire can be forced to a limit not possible under ordinary conditions of firing with the common flat grate.

Another common result from the cost of coal being low is the purchase of engines that are wasteful of steam, the idea being that since the cost of steam is low, it is hardly worth while buying expensive machinery to save it. This is especially true when it comes to the engines operating the fans. How false and futile this reasoning is, can be shown by a few figures; also how this very saving in the first cost of the engines actually entails an actual increase in the cost of the plant as a whole.

For instance, assume the purchase of an engine using 30 lb. of steam per horsepower-hour and of 100-hp. capacity. This engine will use 3000 lb. of steam per hour, and with an evaporation of 6 lb. of water per pound of coal, would require 500 lb. of fuel. If the engine would

do the work on 24 lb. of steam per horsepower-hour, the coal would be reduced to 400 lb., or a saving of 100 lb. per hour. In 3000 hr., the saving would be 300,000 lb., or an equivalent of \$134, and for every 6 lb. advance in steam consumption, the increase in coal will amount to \$134.

Therefore, it is advisable to purchase an engine which is not wasteful in steam. There is, of course, a limit, and that limit is reached when the saving in steam is equal to the interest and depreciation on the increased cost of the engine.

Many engines are wasteful in their use of steam, either on account of their construction or through neglect, so that 50 or even 60 lb. per horsepower-hour is by no means uncommon. In addition to the wastefulness of an uneconomical engine, there is also an increase in the actual investment by the purchase of a machine of this character.

For instance, if an engine of 100 hp. capacity is purchased, requiring 30 lb. per horsepower-hour, a 100-hp. boiler can easily handle it. If, however, the engine requires 60 lb., it will take a larger boiler to supply this steam. Therefore, it is to the interest of every coal operator to see that a good engine is purchased, in order to keep down the ultimate investment, as well as the operating cost.

This done, it is "up to" the operator for economic reasons, to see that the boilers are run with as little coal as possible, which means care and attention to details, as well as the installation of those devices which will show at all times what results are being obtained for the fuel consumed.

Pump-Motor Troubles

A three-stage pump, driven by a compound, direct-current, variable-speed motor, handling drainage water in a mine, gave trouble by taking too much current and tripping the circuit-breaker in the power house when the speed was increased to give the required head, says William Salt, in *Power* for Nov. 10, 1914. At first it was thought to be due to stoppage at the inlet of the pump. Accordingly, the casing was opened several times and the parts examined, but they were free and properly assembled.

The machine was a mile from the power house, and had over 300 ft. of lift. The motor was started in the usual manner with full field, the speed being increased by weakening the shunt field until the pump began to deliver water. The slight rise in speed necessary to increase the flow resulted in a heavy increase in current, causing the circuit-breaker to go out.

Several trials convinced me that the trouble was due to a wrong series field connection, for when the motor was brought up to speed by weakening the shunt field, the series field became stronger by the increased current until at a certain load it overcame the shunt field, and, being in the opposite direction, tended to reverse rotation with the results as noted. Accordingly, the series field connections were reversed, after which the machine was put into service and took only normal load current.

In another instance a small three-phase motor driving a centrifugal pump heated excessively when first put in service. An ammeter in the line showed overload current, and, believing the trouble to be caused by over capacity of the pump on account of the nature of the liquid handled,

the piping was changed so that a test to head and capacity could be made. This showed the motor to be a little overloaded, but not enough to account for the excessive current.

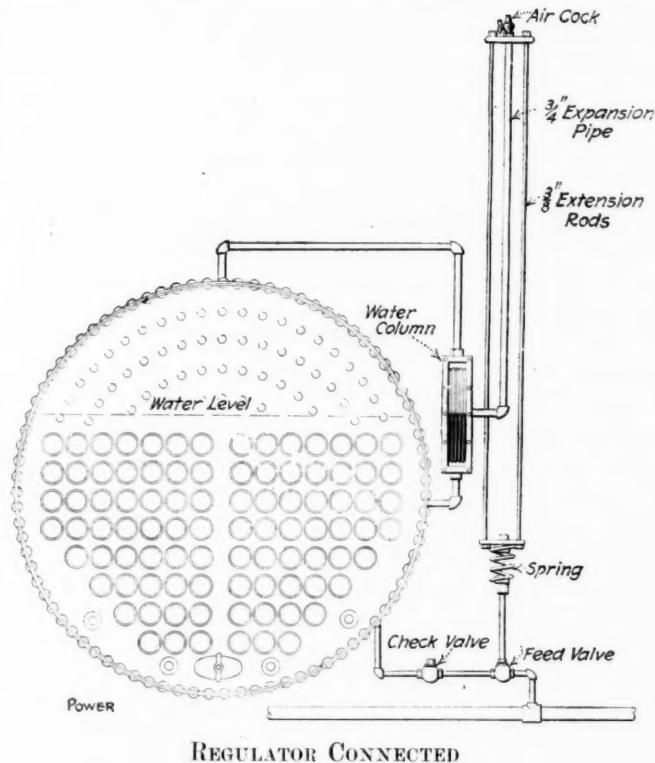
A wattmeter connected in the lines near the motor showed that the trouble was due to the auto-transformer used in starting. All three lines were closed when in the starting position, but in the running position one line was open because of a broken contact finger. This was repaired and the motor operated satisfactorily.

Home-Made Feed-Water Regulator

An engineer called my attention, says Luke Mathier in *Power* for Nov. 3, to his home-made feed-water regulators. He had made them out of odds and ends of pipes and rods about the plant and claims to have the simplest regulator in the world. I do not doubt his statement.

He says they have never fooled him yet and he has perfect confidence in them. The illustration is self-explanatory.

The process is one of balance, the feed valve is maintained in a certain position, feeding gradually and con-



tinuously maintaining an almost even level of water in the boiler. When the water lowers below the second gage cock, steam enters the "expansion pipe" and raises the rod, opening the feed valve. When the water in the column gets above this gage, water enters the "expansion pipe" and contracts it, pushing the rod down, thus closing the valve shutting off the water.

Electric firing eliminates all accidents due to short fuses and reduces the number of those arising from retarded ignition. The use of self-contained electric detonators eliminates the danger which is always present in the handling of loose primers which are intended to be ignited by a fuse. This method of firing also saves time and labor, as all shots are fired.

Editorials

Wanted: A War Correspondent

It is reported that Judge Youmans, of the U. S. Court, has ordered the reopening of the Bache-Denman properties. The U. S. cavalry forces are to be used to aid in this resumption. At the same time the U. S. forces are invoked to keep mines closed in Colorado. Thus a situation grim, but still ridiculous, has arisen. The nation has two heads, the executive and judicial. One believes itself above the law and the other believes the law supreme. Strange to say, the judiciary has been able to make the executive enforce the laws in Arkansas though the President proclaims a higher law in Colorado.

There is also a night-riding insurrection in Muhlenberg County, Kentucky, and federal troops are liable to be called out to prevent violence on negro and nonunion miners. In Butte, Mont., the state militia is still in control of the mining situation. Though we have a brevet captain of the Illinois National Guard and veteran of the Spanish war on our editorial staff, his military experience has been acquired with the rifle, not the pen, and we may yet have to look for a competent war correspondent.

The War and the Foreign Collieries

The war has already closed the best collieries in France. The fighting is both over and in close proximity to the best coal field in that republic, that is, the field lying between Quiévrechain and Fléchinelle, including such well known mining centers as Lens, Liévin, Béthune, Valenciennes, La Clarence and Courrières. The smaller and unimportant field of Pont-à-Mousson is also suffering the rigors of war.

In Belgium, as might be expected, every acre of coal territory is in the hands of the Germans. The main coal field lies along the Sambre to its junction with the Meuse, and is found along the latter river as far as and beyond Liége. It is a continuation of the field in France, but there is another isolated patch of coal also along the Meuse at the town of Dinant.

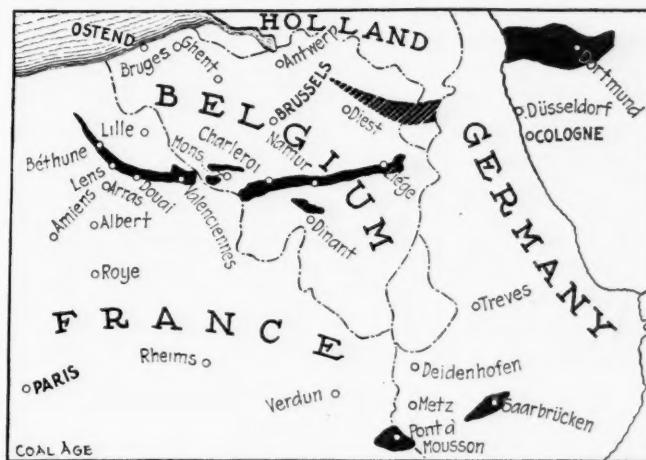
To mention the towns in these Belgium fields is to cite a long list of the places where the Belgians, British and French made heroic resistance to the valor of the German arms. Thus at Liége the Belgians repelled the advance forces of the German army; at Mons and Charleroi the British, few in numbers, made a brave resistance and a courageous retreat in the presence of a superior force and at Dinant the Senegalese and French captured the heights only to lose them twice. Namur was also a scene of severe fighting.

It is said that the Germans destroyed the mines in Belgium on their advance toward Paris. If so, it was an inexcusable piece of folly, for the output of these mines would be of great value to the invaders. The story is probably not true, but it is quite likely that the French and Belgian mines will be destroyed if the Germans

withdraw, for it has always been regarded a justifiable act to demolish such property of the enemy as would otherwise help him to continue his resistance. Both North and South in the Civil War destroyed the coal mines of the enemy whenever they could not avail themselves of their resources.

Thus we may expect to find the output of both French and Belgian mines much reduced after the war. We do not regard the Germans as morally justified in destroying the mines on their retirement, because the British have enough coal to make such destruction of the property of the Allies a negligible factor in the war, but we cannot expect the Germans to observe such considerations, as the Allies have seized, as have also their opponents, every ship they could find on the high seas in a manner which would be piratical were it not justified by every precedent in history.

But how about the Teuto-Turk alliance? In the forefront of the advance of both Western and Eastern allies



THE COAL FIELDS IN FRANCE, BELGIUM AND GERMANY

The shaded field in Belgium is extremely deep and at present produces little coal. Its extent and shape are not clearly defined.

are the coal fields of Germany, Austria and Turkey. The western German fields are between the Ruhr and the Lippe in Westphalia and near Saarbrücken. If these should be invaded by the Allies, it is likely they will endeavor to do them the minimum amount of harm because they will by that time be so clearly superior to the enemy that retreat will be unlikely. They will have every interest in preserving the property of Germany, seeing that only by so doing can they collect from that country an indemnity which will make good the tremendous losses of the war.

On the eastern frontier of Germany are the Silesian fields, which are also exposed to the Russian advance, being situated partly in Russia and Austria. Here the outcome of the war will probably be less favorable, because the Russians have been making a different campaign from the other Allies. They have been disposed to press the offensive with mobile troops which move far ahead of their main line. Consequently, these light troops are

liable at any time to sustain a defeat. When they are attacked in overwhelming numbers they retire to the shelter of their main forces, doubtless doing all the damage they can on their retreat. Only assurance of success makes a victor indisposed to destroy property.

It is unlikely that the Germans will destroy their own mines on the eastern frontier because of the certainty that the British can supply all needed coal from England and Wales. On the western frontier they will be equally indisposed, because, owing to the Russian method of warfare, it is quite likely that the Germans may regain tomorrow a fair proportion of what they lose today.

Consequently when the war is over France and Belgium will be found the principal sufferers. The tipples in France are extremely high, some say as much as 200 ft. They serve admirably for rapid-fire gun platforms, for snipers and for wireless stations and doubtless will suffer severely.

The output of Belgium in 1912 was only 25 million short tons, and the two principal mining departments in France, Pas de Calais and Nord, now ravaged by Germany, produced only 33 million short tons in that same year. So that it is hardly likely that the tonnage loss in Europe after the war is over will be greater than the reduction in market demand.

The Turkish field in Heraclea, which produces about 800,000 tons per annum, will be one of the early spoils of the war. It is probable that as the coal outcrops to the surface it can be readily reopened no matter what the Turks may do to the improvements already erected for its exploitation. They will feel little regret in destroying the present plants, as they are owned in France.

However, as we go to press, we learn that the Russians have rendered the coal mines practically unworkable by a bombardment of "Zungulday" (probably Zoongoldak). It is likely, however, that they will be reopened speedily so that the operations of the Turkish fleet will only be temporarily inconvenienced.

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The Progress of Germany

In our issue this week, Samuel Dean, an Englishman, writes on his visit to the mines in Germany. It cannot be contended that he is pro-German, but his account certainly must be considered as flattering to the people of Germany. Were Napoleon living, he could hardly be induced to believe that the Teutons alone could confront all Europe.

Mr. Dean, himself, is not disposed to take seriously the remark made by a Frenchman with whom he traveled. The billion dollars paid by France to Germany after the war of 1870 is certainly not the cause of Teutonic prosperity, though such a payment seems an immense amount of money. When, however, we think in terms of nations, billions of dollars roll naturally from the tongue. Thus the revenue of the German Empire amounts to about nine-tenths of a billion dollars. The Germanic States separately collect in addition one and a half billions and the colonies 28 million more. So let us not deceive ourselves, there is something *in* Germany and *of* Germany which accounts for its progress. If we in America can find it and imitate it we shall do well.

Somehow we have never been impressed with the transcendent powers of the Germans as individuals. To us they have always appeared "just people," man for man,

very little different in intelligence from ourselves, and not markedly different from the citizens of the island across the North Sea. And we do not see either where Germany has resources in any way superior to our own or those of the British Isles. In fact, we have distinctly an advantage.

We are, therefore, disposed to accept the solution that the excellence of the German colliery plants is due to profits and that profits have been due to syndicates which the government has fostered. Even before these trusts were created, the Germans did not oppose the system of which they were the outcome, and large profits in business were not considered inequitable.

Let us suppose that all business be conducted without profits in America for a number of years and let us grant that the working people save absolutely nothing, but live from hand to mouth. Then if industry is to be enlarged even as fast as the growing population demands, capital must flow from outside.

So, if progress is to be made, it must be, as we recently stated, either by profits or by thrift. We have heard men who made \$400 a year say that they could not save a dollar. Others said the same who were making \$600, \$2400 and \$5000. Whatever the wage, the wage-earner seems unable to put anything by.

The people who are saving are the very rich. Some of them are making so much that only by giving their money away can they keep from growing richer and richer year by year. Thus, it is that profits are a surer source of capital than thrift. We leave it to our readers and ask them how many of them who are wage-earners are saving anything which can make a capital fund for the America of which they believe they are good citizens. The capital fund cannot grow where profits are nil and when the wage-earner spends all he makes in securing impermanent possessions.

Perhaps the German way is not well, but we think if it be continued year by year, in a few decades the growth of capital will be such that the workingman can have out of profits, due to increased mechanical efficiency, as much as he would get today where no profits are made, and his employer will nevertheless make enough out of his labor for the erection of plants which would assure continually increased efficiency.

Thus the German laborer may lag a generation in his wage scale, but ultimately, if the wealthy classes do not become corrupt, he will more than gain on other workmen by reason of increased efficiency in operation. Of course, such increased wealth might make those who receive it corrupt, leisurely and incompetent, but so far it seems in Germany for the most part to have done none of these things.

We do not want to advocate unreasonable profits. Rather would we recommend a degree of thrift, based on careful judgment. But he who will not save, must not venture to lift his voice against those who make profits, for such men are the *benefactors* of the nation. We use the word advisedly and as just fresh from its Latin source. Benefactors may not help us out of any regard for us; they may not be citizens whom we respect and applaud, but whether they are good or bad, whether we like or detest them, they are benefactors when they do us good. And those who build up the capital of the nation are such benefactors, condemn them and dislike them as we may.

Sociological Department

An English Mine-Rescue Station

BY EDWIN HUSBAND*

SYNOPSIS—The coal companies in Europe have large rescue stations which they support for their common advantage. This describes one in the Midlands of England and the methods of training there pursued.

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The Midland Counties of England have near Mansfield, Nottinghamshire, one of the first and best equipped mine-rescue stations in Great Britain. At present it serves 150 mines in the counties of Nottingham and Derby, but two new substations are now being built, one at Chesterfield in Derbyshire and the other at Ilkeston in Nottinghamshire. When these are completed all the mines in the two counties will be within 10 miles of a rescue station.

Already over 100 teams of six men have been trained at this station. After the men have been instructed and have passed a rigid examination they are awarded diplomas but are required to come to the rescue station at stated periods for an efficiency test.

The practice building consists of two long circuitous and narrow galleries, in one of which the conditions have been made to resemble as nearly as possible those of a mine where an explosion has actually taken place.

There are small openings over the imaginary roof falls measuring about 21x24 in. Through these, the rescue party must pass, encumbered as they are with their Meco breathing apparatus. They must also take with them on a steel stretcher a dummy, weighing as much as an average man. During the final training the teams are required to stay for two hours without coming out into fresh air in a poisonous atmosphere produced by the burning of hay, straw, shavings and sulphur.

While there the men are required to load a car with brick, push it along a portion of the gallery, build a properly bonded 9-in. wall, set props and hang brattice cloth, then dismantle the work and remove it to another place. During the practice, at a favorable opportunity, the superintendent who carefully watches the team through the windows, rushes in and disarranges the breathing apparatus of one of the students, at the same time calling attention to that fact.

The rescue work ceases immediately, and the men at once turn their attention to the comrade whose apparatus is out of order. The captain carries, strapped to his belt, a small tin can which contains an outfit, to be used only when the breathing apparatus of any of the team is disarranged. He takes out the emergency outfit and connects it to a spare cylinder of oxygen. The mouthpiece of the injured apparatus is removed from the mouth of the wearer and that of the emergency outfit substituted.

All this is done in much less time than it can be de-

scribed, and so neatly and quickly is it performed, and so well, that the wearer does not experience the least inconvenience by the change. The captain then repairs the injured apparatus, which is then readjusted, and the emergency outfit is replaced in the can ready for use again whenever required.

The course of instruction extends over a period of 12 weeks, and commences with a series of lectures by the superintendent on the various aspects of rescue work. The men are then allowed to wear the apparatus in the galleries and do practice work, but the chamber is not filled with irrespirable gases. During the eighth week for the first time during their training the galleries are filled with noxious gases, and the team is instructed to do nothing but sit still for one hour, after which the men walk about the galleries for an equal length of time. The next lesson consists of rescue work under conditions similar to those which usually exist after an explosion.



CRESWELL No. 2 COLLIERY RESCUE TEAM AT MANSFIELD, NOTTINGHAMSHIRE, ENG.

The superintendent's final instructions to each team before entering the poisonous atmosphere are: Keep together. Watch each other's gages, and if any man's apparatus goes wrong, don't put him out, but instead immediately apply the emergency outfit.

The Mansfield rescue station has a fine rescue car, somewhat similar to the one used by the U. S. Bureau of Mines. The building is equipped with a gas-testing machine, constructed under the Oldham patent, changerooms, baths, oxygen storehouse and cylinder-charging machines. There is also a comfortable house for the superintendent where, after practice, each team is provided with a substantial meal. This rescue station is financed by the various companies operating in the two counties, and is governed by a board appointed by these companies. Every man receiving training is paid by the corporation which employs him.

After completing the rescue course, each man is instructed in gas testing and must undergo a rigid examination before receiving a certificate of efficiency for mine-rescue work. This test consists of the art of detecting small percentages of firedamp in the Oldham gas-testing

*Superintendent, Wadsworth Red Ash Coal Co., Helena, Ala.

machine and stating the different percentages to the examiner. It is now one of the British mining laws that all firebosses in order to retain their positions must pass the above named tests once every five years.

Since my visit to this rescue station, the mine owners have decided to use a liquid-air rescue apparatus, termed the Aerophor, instead of the oxygen type, and have built a liquid-air plant, which does not require a skilled attendant. It consists of a three-stage air compressor, the air being drawn through a purifier and compressed to 200 atmospheres. After passing through another purifier, it goes to the liquifier and expansion engine, and is then drawn off and stored in vacuum bottles. The weight of the apparatus, including a full charge of about 10 lb. of liquid air, is 30 lb., and, of course, the load gets lighter as the liquid air becomes used up by the wearer.

The English Language in the Coal-Mining Regions

BY JAMES STEELMAN

SYNOPSIS—English should not be taught to foreign miners as a book language but as a living tongue. The teacher by performing the actions which his words describe, and by inducing the pupil to imitate both words and action, can teach him English even when the instructor is entirely ignorant of the language or languages which the pupil can speak.

Employers are everywhere awaking to the truth that a reasonable amount of money spent upon improving the efficiency of the employees is a good investment, the returns on which are prompt, sure and adequate. We should not be surprised then to learn that coal operators are beginning to realize that, if they can remove from the foreign laborer the handicap of ignorance of English, they themselves will be greatly benefited, so greatly in fact that they can afford to spend time and money on solving the problem presented.

The strained relations that so often exist between employer and employees are undoubtedly due in large measure to ignorance on either side of the conditions under which those on the other side are laboring. A grievance gets under way. It is bound to grow in an atmosphere of ignorance of the facts. Now the basis of a common understanding must depend upon a means of communication. Otherwise, grievances cannot help growing. But, how can the management keep in touch with masses of men speaking many languages, of which English is not one?

Again, the proper conduct of mining operations turns on the men understanding the orders and directions. Their safety depends largely on their comprehension of regulations. Here again, English is the great need.

In short, there can be no doubt that a mine or any other enterprise will run much more smoothly—that is, much more economically—if the men have a grasp on the fundamentals of English; if they understand the spoken word, and the printed rules and regulations. It is just as reasonable to pay money to provide a lubricant here as anywhere else. Of course, it is impossible to express in definite figures just how much benefit there is to the employer. But the matter is sufficiently clear to make it a reasonable proposition for the coal operator to provide for the instruction requisite.

LITTLE KNOWLEDGE OF ENGLISH REQUIRED

About one-half of the population in the coal regions of Pennsylvania is foreign. Nearly all these foreigners speak something other than the English tongue. A large proportion know little or nothing of the language of the management. How shall it be remedied, if indeed there is a remedy?

It is important to note that the required cure is easily provided. We need to teach foreigners English; but this does not mean that any real grammatical training is at all necessary to meet the situation. The amount of English actually necessary is inconsiderable. Syntactical exactitude, extensive vocabulary, perfection in pronunciation—none of these is required. All that need be sought is to impregnate the foreign workman's mind with a grasp of English which every American child possesses.

This means a vocabulary of perhaps 300 or 400 common words; certain terms belonging to his everyday activities will, of course, have to be included, but it will be a child's knowledge of language, nevertheless. He will not have to know how to parse. It will be an unnecessary refinement for him to learn that he ought to say, "I walk slowly," instead of "I walk slow," or that "which" should not be used when referring to persons. If he has trouble with the pronunciation of certain sounds, and persists in saying "dat" and "winegar" and the like, what of it? His pronunciation of a small circle of words must be good enough to be intelligible, that is all.

A good working knowledge of a small vocabulary will cover his principal requirements. If he is to be taught to read in order that printed directions may not remain unknown to him, it will perhaps be necessary sooner or later that he shall get some idea of spelling. But this will be limited to his vocabulary. Ordinarily, it will be unnecessary to teach him to write more than his own name. When the actual necessities of the case are taken into consideration, it will be seen that the matter is greatly simplified. In fact, the acquisition of enough language to meet modest necessities is quickly possible for untrained minds.

PROGRESS MADE AMONG ILLITERATES IN KENTUCKY

In the United States there are districts where a considerable percentage of the population is unable to read and write. They use English as a spoken language; but reading and writing are beyond their knowledge. Kentucky is a good example. This state is by no means the most illiterate of all; still 12 per cent. of her population over 20 years of age are unable to read and write. Here is a problem concerning men and women. It is not a question of school children at all. Thus it is a difficulty comparable with that existing in the coal regions. In Kentucky, the problem is to teach the printed not the spoken language. No doubt, it is easier to teach an American how to read English than it is to teach a foreigner the same thing. On the other hand, the educational effort in Kentucky does not shrink from dealing with the oldest pupils—persons over 70 and 80 years of age. It is being demonstrated there that even old people can be taught. Indeed, it is being shown that for this only a short period of training is needed.

Two or three years ago, one of the Kentucky school superintendents, Mrs. C. W. Stewart, stirred up her band of teachers and made through them a determined and successful effort to inaugurate evening schools for

the illiterate. On Sept. 4, 1911, the teachers of the whole district of Rowan County, visited the homes of the people in their several neighborhoods and notified them that upon the following evening a school would be opened. More than 1200 persons responded at once. The ages ran from 18 to 86. It turned out that these people were most eager to learn; that nothing in the way of physical difficulties would stop them. The movement spread to other districts. Now Kentucky has for her slogan, "No illiteracy after 1920."

I will give some illustrative examples of the results. A woman 70 years of age was able to write a legible letter after 8 nights of work; a man of 50 did the same after 7 nights; another man, 30 years old, succeeded in the same task after 4 nights. Pupils were accepted who could read and write, but who wanted to make further progress. But in the second term, there were 300 illiterates out of a total enrollment of 1600. The movement is succeeding. It is old enough now to have failed, if there had been some fundamental defect in its conception. It shows that grown people can be interested and taught the most elementary things. It may not be possible in so brief a time to get the same results with a mass of men from foreign countries as have been obtained with citizens in Kentucky, because they have greater difficulties to surmount. But the work is worth doing, even though it may not be possible to do it in a couple of weeks or so.

THE TEACHING OF FOREIGNERS IN NEW YORK CITY

In New York City, the problem of teaching foreigners the English language has received much attention. It will readily be understood that with her immense and ever-growing foreign population, New York has been almost forced to attack and solve the question. The Board of Education maintains classes for the purpose and has been doing so for a number of years. In fact, as far back as 1906, a definite method was formulated and adopted. This system seems to differ from that of Peter Roberts described in COAL AGE for Aug. 22, pp. 350 to 352. On the other hand, there are prominent similarities. As the New York system has the prestige of proved success behind it, it will be well to learn precisely how it is carried out, so that teachers in the mining communities may have exact knowledge.

In the New York system, a beginning is made by making an appeal to individual self-consciousness and utilizing a point of contact between the pupil's native language and English. I will make this plain by giving a typical example of the manner in which the teacher gets under way. The class is supposed to be assembled, whereupon the instructor calls out the name of some pupil. The name will be alike in English and in the pupil's native tongue. Perhaps no one replies. Nevertheless, the pupil is pretty sure to manifest a degree of self-consciousness. Besides, others in the class will recognize the name and direct their attention to the pupil called.

The teacher will now plainly direct his eyes to the pupil in mind, and say, "Johann Schmidt, stand." As he utters the word "stand," the teacher will get up from his seat and thus exemplify in his action the meaning of this word, which is really the only English word in the sentence. If the pupil fails to get the meaning, or for some other reason does not stand up, still the teacher may be sure that some of the others have caught the drift of things. So he will turn to another name on his list,

and say "Antonio Nicoletti, stand." He will now, or else a little later with some other name, get a response. However, the teacher must rise, whenever he enunciates the word "stand." After one response, others will be easy to obtain.

The teacher will give a word of commendation after every success; such as "Good!" "Right!" "Yes!" "That's right!" He will nod or otherwise act approval in addition. The situation now is that the teacher and a number of pupils are on their feet. He will now say, "Antonio Nicoletti, sit," and at the same time resume his own seat. If Antonio fails to get the idea, another pupil is addressed; but the teacher in each and every case acts the meaning of "sit" upon speaking the word, at least until a proper response is obtained. We have, in the foregoing, illustrations of one of the fundamental rules of the method: *First the idea, then the word; or, Simultaneously act and word.*

Pupils and teacher are now seated. He turns to one of the successful pupils, and says, "Antonio Nicoletti, stand." He goes on, looking at the pupil and pointing to him, and says, "Your name is Antonio Nicoletti." He calls upon another to get up, saying, "Your name is Zelig Kaliski." After a number are up, the teacher will say, pointing to himself, "My name is Mr. Brown." Then, looking straight at one of the pupils standing he says, "What is your name?" After some effort, a correct response will be obtained: "My name is Zelig Kaliski." The procedure is then continued, until all have resumed their seats. The words to which particular attention has been secured are: *Stand, sit, my, your, name, is, what.*

NOT ONLY TEACHER BUT PUPILS ALSO ILLUSTRATE WORDS

The foregoing may constitute the first lesson. In a second lesson, the teacher will ring the changes on the words previously learned, particularly the verbs. Thus, he will say, pointing to himself and rising, "I stand." He resumes his seat, saying, "I sit." Then turning to the class, he will address one of the pupils and say, "Antonio Nicoletti, stand"; following the request with another, "Antonio Nicoletti, sit."

Of course, the teacher sees to it that properly responsive actions are given to both requests. Now, he asks Antonio again to stand, he himself getting up at the same time and saying, "I stand." If Antonio says nothing, the teacher urges, "Say, I stand," and persists until success is obtained. The same procedure is followed in teaching, "I sit." But always now the pupil performs the act before or at the time he is required to say the word.

Next, pointing to several pupils one after another, the teacher will say, "Zelig, stand"; "Johann, stand." He seeks to get both action and word. Similarly, with the word "sit." Then, leaving off the name, the pronoun is introduced—"You stand"; "You sit." After exercising along this line for awhile, the teacher will exclaim, "Antonio, Zelig, stand." Then he will follow up this with, "All stand," making some gesture to indicate that the whole class is meant. Then, "All sit."

After spending some time on a review of this character, the teacher will proceed to introduce a new verb. The old must be conveyed first, or at least simultaneously. The old words may be utilized and all unified in a single group of actions. Thus, performing the several actions, the teacher will say, "I sit, I stand, I walk, I sit."

ILLUSTRATING PRONOUNS

A pupil will now be requested to go through the actions and the sentences. Then a number of pupils are asked to act and speak in a group, "We sit, we stand, we walk, we sit." A new pronoun is thus brought in. As the group moves over the floor, the teacher will say, "They walk." The pronoun "you" may suitably be introduced at about this stage. But always there must be the association of action and word.

If possible, the action should be that of the pupil; but it will at times happen that the teacher must be the one to act; especially will this be the case where the word is new. Sooner or later, however, the pupil must have, if possible, his own personal relation to the act, at the same time uttering the word—he must *perform* it or *request* it, or in some way have *to do with* it.

It will be seen that by following this method through several lessons, the nucleus of a vocabulary will be built up. The *sound* of the words will be associated with a real knowledge of the *meaning*. It may be well to stop a moment here and explain the value of having the pupil connect the sound with his own personal activity rather than with that of some other person. Of course, a pupil can learn the meaning of "stand" by *seeing* the teacher or another pupil go through the act; but it will undoubtedly be a harder process and a longer one to associate the sound with the act than if the pupil himself participates.

What one does himself makes a livelier impression than what he sees another do. Consequently, associations based upon such lively impressions will be stronger, more vivid and last longer. No doubt, the fact is due largely to the principle that we are more interested in ourselves than in other people. What *we* do awakens our keen and interested attention. By all means, then, the pupils should be made to go through the acts and otherwise associate themselves with the ideas. The words should be pronounced at the time, so that act and word may connect themselves in the memory.

AND NOW PREPOSITIONS ARE ADDED TO THE VOCABULARY

But let us go somewhat further. In what may be the third lesson, the teacher will utilize the three verbs already learned in adding to the general vocabulary. Thus, he points to an object and says, "The desk." Then, seated at a distance from his desk, the teacher will say, "I stand, I walk, I walk to the desk," suiting his action to the words. Then, "Johann, walk to the desk." The pupil will be encouraged to imitate the teacher, saying and acting, "I stand, I walk, I walk to the desk." In this way a new word or expression is introduced and old ones reviewed. Similarly, "to the window," "to the door," etc., may be brought into the conversation.

Mature persons probably have more difficulty in some respects than children. Thus, the vocal chords of the older people will be less flexible and they consequently will have more difficulty in pronunciation. On the other hand, the mature persons may be expected to have a greater determination.

In New York, a man of perhaps forty acquired in three weeks a sufficient knowledge of English to make a speech and win a prize (\$5 in gold). He had been only four weeks in America. His pronunciation was inexact; but it was intelligible, which is the main point. This is an extreme case. We cannot expect continually to repeat this result. For a night class, which meets five nights a week,

it will probably require from four to six months to impart the amount of English deemed necessary for a workman's needs.

THE METHOD IS USED IN GERMANY

In Germany, after fourteen weeks' instruction—in this case the pupils appear to have been young persons—such results as the following were secured: The boys were standing when the teacher entered the room. He said, "Sit down." They obeyed, saying as they did so, "We sit, we are sitting." The teacher went to his desk; whereupon, without speaking, by simply looking at various boys, he obtained from them an account of his actions.

Now one pupil, now another would respond to the teacher's look and act, saying, "You are standing on the platform;" "You are going to your desk;" "You are sitting;" "You are taking your pen;" "You are writing your name;" "You are putting the pen on the table;" "You are taking the blotting paper."

At this point, a boy was called up and asked to go to the door. He obeyed, saying, "I am going to the door." One section of the class said, "You are going to the door;" another said, "He is going to the door." Similarly, the following expressions were dealt with: *Opening the door, shutting the door, leaving the room, etc., etc.*

The exercises went on to more difficult matters. The teacher asked, "What are you going to do?" "What are you doing now?" "What have you just done?" The pupil was required to answer; other pupils were required to address him and to speak of him. These exercises related to the three questions as to the immediate future, the present and the immediate past.

THE ADVERBS ARE ALSO TAUGHT BY ILLUSTRATION

The exercises proceeded after a little, the teacher requiring two boys to rise and walk round the room. Sometimes at the same pace, sometimes with the one boy walking more rapidly. The teacher said, "You must first see it and then speak about it." Such sentences were spoken as these: "You are walking more quickly than your friend;" "You are not walking so quickly as your friend." The two boys were required to place themselves, one before, the other behind, the teacher.

As they did so, either had to state what he was doing. The teacher addressed to the class the questions: "Who is standing in the middle?" "Who is standing before me?" "Who is standing behind me?" The two boys, one being taller than the other, were placed side by side, when such responses to the teacher's questions were made as, "Wilhelm is taller than Johann;" "Johann is not so tall as Wilhelm." Various persons of the verb were introduced: "I am not so tall as Wilhelm;" "You are not so tall as Wilhelm;" "He is not so tall as Wilhelm." This is not all; but it is sufficient to show what may be done in a reasonably short time. It should be borne in mind that in this actual case there was probably more attention paid to the niceties than would be at all necessary with miners learning simple English.

The pole star for the teacher handling such work is, *First the idea, then the word*. Associated with this rule is this other, *Impress the idea by the personal participation of the pupil*. If these companion rules are faithfully followed as far as circumstances permit, then prompt success may be expected, whether the pupils are boys or men; whether they are especially intelligent or not.

The Knoxville Meet

SPECIAL CORRESPONDENCE

"The Interstate Miners' Field Day" held under the auspices of the Society of Tennessee Mine Foremen at Chilhowee Park, Knoxville, Tenn., Oct. 24, was the most successful yet held by the society. Eighteen teams competed in the first-aid contests, and the work was of the highest order. In commenting upon the splendid work done by the first-aid men, one of the judges remarked that some of the work was equal to that expected of a hospital interne.

Several departures were made from previous methods. The field was arranged in the shape of a rectangle, which was

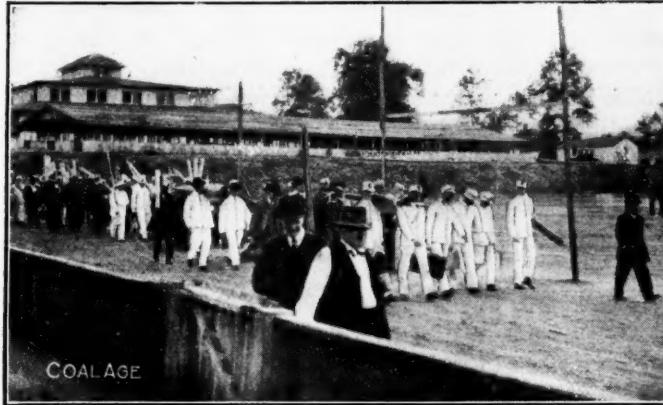
The teams competing were as follows: Proctor Coal Co., Lewis Francis, captain, Red Ash, Ky.; High Cliff Coal Co., Joseph Rigsby, captain, Pruden, Tenn.; Pruden Coal & Coke Co., R. C. Speaks, captain, Pruden, Tenn.; Black Diamond Coal Co., Wm. Craven, captain, Coal Creek, Tenn.; Knoxville Iron Co., John E. Woods, Jr., captain, Briceville, Tenn.; Royal Consolidated Coal Co., Ed. Wilkes, captain, Briceville, Tenn.; Stearns Coal & Lumber Co., J. L. Butler, captain, Stearns, Ky.; Black Diamond Coal Co., E. L. Hendren, captain, Coal Creek, Tenn.; Piedmont Coal Co., Geo. Vinsanty, captain, Oliver Springs, Tenn.; Roane Iron Co., J. Phillips, captain, Rockwood, Tenn.; New Careyville Coal Co., J. W. Duncan, captain, Careyville, Tenn.; Stonega Coal & Coke Co., E. Drennen, captain, Big Stone Gap, Va.; Westbourne Coal Co., auxiliary team, Jef-



TEAM OF THE ROANE IRON CO., ROCKWOOD, TENN.



PASSING A LITTER THROUGH AN ARTIFICIAL OBSTRUCTION



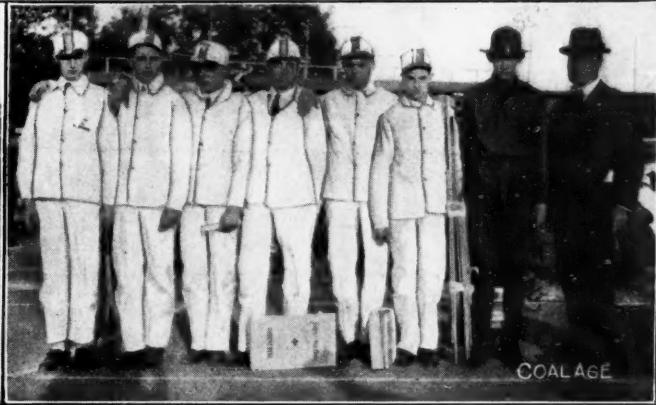
THE TEAMS AT THE KNOXVILLE MEET IN PARADE

itself subdivided into smaller rectangles, each team being allotted one of these. Only five teams were working at once, which, of course, lengthened the time of the entire event but added greatly to the efficiency of the judging. Another innovation was the use of Boy Scouts, who assisted in every way possible. A Scout was assigned to each team, and to the one doing the most efficient work a prize was offered.

The chairmen of committees were as follows: D. T. Blakely, general; H. H. Ashmore, awards; J. R. Williams, publicity; H. H. Braden, first-aid organization; Geo. E. Sylvester, advisory; E. A. Schorn, field.

The chief marshall and chief usher were Boy Scouts, the chief recorder was W. D. Barton, and the local representative of the Red Cross, and chairman of the board of judges was Dr. S. R. Miller.

H. M. Wilson, engineer-in-charge of the Bureau of Mines at Pittsburgh and secretary-treasurer of the American Mine Safety Association, and E. B. Sutton in charge of the work of the Bureau at Birmingham, Ala., were active in promoting the meet. The Pruden Coal & Coke Co.'s employees' band of 15 pieces from Pruden, Tenn., furnished the music.



THE STEARNS TEAM, A BOY SCOUT AND J. E. BUTLER

erson Hill, captain, Westbourne, Tenn. Among the events were the following:

One-Man Events: Right cheek and right foreman cut and bleeding.

Lacerated scalp on top of head, left hand crushed.

Machine boy while running fell and cut a vertical gash on his kneecap and punctured the palm of his right hand with a machine bit, bright red blood; treat and carry 50 ft.

Two-Man Events: Left collar bone broken, simple fracture of left thigh.

Miner found lying face down unconscious, on a live electric wire, abdomen badly burned; rescue and give treatment.

Left arm twisted around shaft of mechanical post auger. Release arm and dress for two compound and three simple fractures below elbow.

Three-Man Events: Left ear torn off, left shoulder dislocated; compound fracture of left leg.

Head, face, neck, arms and hands burned by gas ignition.

Tamping bar blown through right thigh, causing compound fracture, bar remaining in wound.



THE CONTESTING TEAMS AT WORK

Only five teams worked at one time

Four-Man Events: Patient unconscious from gas inhalation, right forearm broken, improvise stretcher and carry 50 ft. Fingers and left hand lacerated by sprocket wheel and chain, bright red blood; compound fracture of right forearm. Man is found lying on his back on live electric wires, unconscious, back burned at waist line; demonstrate three methods for his removal; treat and carry on stretcher 50 ft.

Team Event: Burns on face, neck, cheek, back and arms; carry over obstruction.

The first grand prize was \$25 in gold, silver medals of the American Mine Safety Association and bronze medals of the

STEARNS COAL & COKE CO. TEAM

Winners of first prize. Score, 100 per cent.

suction end of the jet to the water supply. The delivery end of the pump was connected to the line leading to the bath sprays. We found the arrangement satisfactory, as it gave a steady flow of water, the temperature of which could be easily regulated.

While we use the jet pump in connection with showers, it would serve equally well for tubs or other forms of baths. If a jet pump is not available, a discarded injector or ejector would give satisfaction in its place.



THE FIVE JUDGES WHO DECIDED THE MERITS OF ALL CONTESTANTS

American Red Cross won by the Stearns Coal Co., Stearns, Ky. The second prize was awarded to the Knoxville Iron Co., of Briceville, Tenn., and the Tennessee cup went to the same team. There were about 25 prizes in all.

Bathhouse Hint

By DAVIS CROW*

In the bathhouses at the mines of the Houston County Coal & Mfg. Co., live steam was used to heat the water for bathing, but the steam in mixing with the current made its flow irregular, causing it to "flutter." We did not wish to take hot water from the boiler at a point below the water level, for, if the hot-water valve were accidentally left open, it might drain the boiler until the water level was dangerously low.

To overcome these objections, a discarded jet pump was used, connecting the steam line from the boiler to the steam connection of the jet, and also connecting the

*Engineer, Houston County Coal & Manufacturing Co.

Glen White School

One of the up-to-date towns in Raleigh County, West Virginia, is Glen White. Robert S. Gatherum of the faculty of the University of West Virginia is organizing the educational work in this village. At the age of 14 he entered the mines as a trapper-boy. He dug coal for eight years, and then went to the University and graduated as an engineer. He has started a school at Glen White at which will be taught reading, writing, arithmetic, properties of mine gases, ventilation, geology of coal, mining methods, care of safety lamps, physiology, sanitation, etc.

The Benton, Ill., Rescue Crew

The first team of helmetmen on the scene of the Royalton explosion was that of the State Mine-Rescue Station, Benton, Ill. They arrived about 2½ hours after the catastrophe and were able to do most effective work.

From left to right in the illustration the names of the men are as follows: James Towal, superintendent; M.



STATE MINE-RESCUE TEAM OF BENTON, ILL., STATION

J. Carragher, assistant superintendent; Walter Nichols, assistant superintendent; William Watson; James Thompson; Alex. Marshall, captain; Walter Anderson and Munro Marshall.

Discussion By Readers

Mining Laws, Legislation and Mine Regulations

Letter No. 5—I am glad to see suggested, in COAL AGE, the need of a thoroughly practical discussion of existing mining laws and mine regulations. There are many things that require careful consideration and immediate attention in this respect. The most important of these is unquestionably the enforcement of many good mining laws already on the statute books of many states. It might be a leading question to ask, but it is nevertheless a most important one: How many mine inspectors enforce the existing laws? Again, do the mine inspectors, in many states, dare to enforce some of the laws on the statute books?

It is sad to say that we all know too well the full meaning and import of the phrase so commonly heard spoken, "He has a good stand in;" or "He has a good pull." These phrases are most commonly used in relation to the acknowledged condition of a successful candidate in a state where the appointment of mine inspectors is made by the governor. It is only too true, in a majority of cases, that the successful candidate has the indorsement of and secures his appointment mostly through the large coal companies of the district wherein he resides or is best known. Without reflection on the man's honesty of purpose, it may be stated frankly that, under these conditions, it cannot be expected the appointee on entering office will willingly, or can successfully, oppose the wishes and plans of his friends who secured his appointment. What is the result? *Can the full enforcement of an offensive law be expected under such conditions?*

I give this brief outline merely as a thought in passing to what I consider a *most important law* in coal mining, and one that should be enacted and enforced in every coal-mining state. I refer to the law requiring the examination of mine workings, including all airways, passageways and working places, by a competent fireboss at from 3 to 4 hr. before the time for commencing work in the mine. Such a law should also define, in detail, the manner in which such examination should be made, the means used and the extent of territory required to be examined by each fireboss.

While I am unable and cannot be expected to furnish statistics confirming my belief in this regard, I am fully convinced that many mine fatalities occur every year, which are caused by inadequate mine inspection, at a safe time limit before the hour for the miners to start work in the mines.

My experience, however, enables me to testify to the looseness and incompleteness of the mining law in several states, in regard to the inspection of the mine before the time for the men to enter. This is particularly notable in Indiana and Alabama. In these states, it is a common thing for the fireboss to start his examination of the working places anywhere from 6 to 8 hr. before the time for the miners to commence work. The danger from such loose laws relating to the safe operation of

mines is only too obvious. I would ask, Is it possible for a fireboss to tell a man that his place is "O.K." when his examination of that place was made 8 or even 6 or 5 hr. previous? I answer, No fireboss, in a gaseous mine, can truthfully say that a place is "free from gas" 6 or 8 hr. after making his examination. The most he can say, in that case, is that the place contained no gas when he made the inspection.

I could name several accidents caused by miners entering their working places after those places had been O.K.'d by the fireboss and were supposed to be safe for work. Even the excellent editorial, entitled "The Mulga Inquest," COAL AGE, Oct. 31, p. 715, furnishes ample evidence that, in this case, there was something wrong in the regulations of the mine, to say nothing of the requirements of the state mining law, respecting the manner in which the examination by the fireboss should be made.

I want to say, in closing, the state mining law should require coal companies to employ a sufficient number of firebosses to make it possible for each man to examine carefully all the places in his charge, and to start such examination not more than 2 hr. before the time for the men to enter the mine. While this is but one of the many evils existing in the mines of this country today, it is a feature of mining law that, if corrected, would, with the help of fearless and honest mine inspectors, go far toward reducing the number of mine explosions.

WILLIAM CROOKS, Mine Foreman,
T. C., I. & R.R. Co.

Edgewater, Ala.

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Gasoline Mine Locomotives

Letter No. 4—I have read with interest the letter signed "Mining Engineer," COAL AGE, Oct. 24, p. 683, drawing attention to the comments of O. P. Hood, mechanical engineer of the Federal Bureau of Mines, in his paper entitled "Gasoline Locomotives in Relation to the Health of Miners," read at the Pittsburgh meeting of the American Institute of Mining Engineers, October, 1914.

In his paper, Mr. Hood makes a few statements that tend to prejudice the mind against the use of gasoline locomotives in mines, although we believe this is not his intention, as he states at the close of his article, that "A wide field of usefulness for these locomotives remains, where it is believed there would be no injurious effects upon health."

In referring to these statements, Mining Engineer says:

He (Mr. Hood) adds that the percentage of this gas (carbon monoxide) in the mine air will depend upon the amount of gas present in the exhaust, as compared with the quantity of air passing on the haulage road; but he (Mr. Hood) considers that it will be necessary to provide ventilation for the worst condition that can result.

Permit me to say in reply to this statement that no employee of our company will sell a gasoline locomotive to any coal operator before he, as engineer, has made a complete examination of the mine or mines in which the

locomotive is to be used; and if, in our opinion, there is the slightest chance that danger will arise from such an installation and the necessary changes to eliminate such danger cannot be made, we refuse to furnish this type of locomotive.

It is worthy of note that, wherever our gas-driven locomotives have been installed, their operation has been successful. It may also be added that, under gaseous conditions that would prohibit the use of an electric locomotive, the gasoline locomotive may be successfully installed.

Again, in the next paragraph, the following statement is made:

It is stated that while, under normal running conditions, this gas rarely exceeds 6 per cent. of the total exhaust, the quantity may, owing to a bad adjustment of the carburetor, be increased to 13.5 per cent. It is clear that since such a wide variation in the percentage of this dangerous gas is possible, this fact coupled with the possibility of a slack ventilation on roads or in places where the locomotive may be working, makes it necessary to observe great caution in the use of these machines.

The responsibility for this condition rests with the company and the man running the motor. Where a competent motorman is employed, such a condition should not arise. Also, in a well ventilated and thoroughly equipped mine, it seldom happens that there is any slack ventilation on the haulage roads where motors are in operation.

Another paragraph draws attention to "the possibility of the locomotive running in the same direction in which the air current is traveling, and perhaps with the same speed or velocity, in which case the gas would reach a dangerous percentage in the air to which the engine runner would be exposed." In the same paragraph it is said that Mr. Hood mentions the "danger of permitting a gasoline locomotive to stand idle for any length of time, except in an ample ventilating current, and advises the use of a self-starter on all gasoline locomotives."

In reply to this suggestion, I would say that the addition of a self-starter is generally a source of unnecessary expense and trouble. Such a self-starter is not required on one of our locomotives, which are equipped with a patented cranking device that cannot kick back, no matter how long or how short is the pull given by a motorman in cranking.

Permit me to say, in closing, that this type of locomotive has met with a considerable amount of ill use, abuse and condemnation, simply because it has been *installed under improper conditions* and, again, *forced to operate under overloads*. As stated previously, such unfortunate installations are avoided in our practice, by making a careful and intelligent investigation before the installation is permitted.

G. W. HAMILTON, Mining Engineer,
Milwaukee Locomotive Mfg. Co.

Chicago, Ill.

Letter No. 5—In the reading of G. W. Hamilton's letter on Gasoline Mine Locomotives, COAL AGE, Sept. 12, p. 440, my attention was drawn very strongly to one point in particular. For some time since, I have wanted to add a few words of caution in respect to that point. In his letter, Mr. Hamilton makes the following statement:

The further statement that the exhaust from a gas-driven engine vitiates the mine air is not true when this type of locomotive is used for haulage on main or cross-entries, because the exhaust has now been deodorized so that it is

not perceptible in a mine where these locomotives are installed. The odor of the gasoline cannot be detected even in the main-return entries of such mines. The only reason that the motors cannot be used for gathering work in rooms or chambers is that the carbon monoxide given off in the exhaust requires to be diluted by an air current in order to render it harmless.

Before commenting on this statement, permit me to remark that this is an age of endeavor along educational lines, in which almost all people engaged in the coal industry are taking part. Operators, technical magazines, colleges, federal and state bureaus of mining and many other organizations are trying to provide a fair measure of both common and technical education that will be adapted to all classes of mine labor, in the hope that all will profit thereby. The way in which the miners themselves are responding and the movement gaining headway is gratifying indeed. This is realized by no one more than by those actively interested in prosecuting the work. Manufacturers of all classes of mine equipment are equally interested in this campaign, and, in general, are active in giving it their support.

What I have to say in criticism of the statement of Mr. Hamilton to which I have referred is written chiefly for mine managers (foremen), miners and all underground employees. I have been prompted to write this comment, on overhearing a recent remark made by a mine foreman, which was something to this effect, "By George, these gasoline locomotives don't give off any gas at all. Why, you cannot smell anything." I want to say that it is the *absence of odor* in the discharge that makes the latter even more dangerous than where the smell reveals the presence of the gas. Because there is "no odor" to the discharge, the sense of danger is largely eliminated; while, on the other hand, the odor when present assists to emphasize the danger that may often exist in the discharge of this type of locomotive.

It should be recognized as a fact that *the absence of odor does not indicate any reduction in the quantity of carbon dioxide (CO₂) present in the exhaust gases*; in fact, there may be more carbon dioxide produced, assuming perfect combustion to have taken place. Nor does *the absence of odor necessarily mean a less percentage of the extremely poisonous gas, carbon monoxide (CO)*. I am informed that *the deodorization of the gasoline does not reduce the quantity of carbon monoxide produced in its combustion; but this is solely dependent on the supply of available oxygen, which must be sufficient to burn the carbon monoxide to carbon dioxide*. In other words, there must be sufficient available oxygen in the cylinder of the engine to enable the complete combustion of the gasoline.

Recognizing, then, that the gasoline locomotive may give off both carbon dioxide and carbon monoxide in quantities that would be dangerous to the health of underground workers, it becomes necessary to confine the operation of these motors not only, as Mr. Hamilton states, to "haulage on main or cross-entries," but I would add, their operation should be confined to such main and cross-entries as are used for the return of the air current or to entries ventilated by an air current that does not pass into the working places of the mine.

The character of both carbon dioxide and carbon monoxide is too well known to make any comments necessary here, further than to say that neither of these gases has any odor, but the presence of either or both tends to vitiate the mine air. While small quantities of carbon

dioxide (CO_2), in the air breathed, are not inimical to health or dangerous, it is important to remember that extremely small quantities of *carbon monoxide* (CO) may prove fatal, the presence of 0.1 per cent. of this gas, in air, being sufficient to produce death when breathed for a sufficient length of time. It is quite well known that the effect of carbon monoxide on the human system is cumulative. The gas is quickly absorbed by the hemoglobin of the blood and retained largely until a sufficient amount is absorbed to prove fatal. The affinity of the hemoglobin of the blood for this gas is more than two hundred times as great as that for oxygen.

In all these matters, it is important that we not only keep ourselves well informed of possible danger, but avoid deluding, by careless statement, those whose lives may be dependent on this knowledge.

H. D. EASTON, Instructor,
Illinois Miners' and Mechanics' Institute.
Springfield, Ill.

■

The Foreigner in Mining

Letter No. 9—The criticisms of Charlton Dixon, COAL AGE, Oct. 3, p. 561, and J. D. Jones, Oct. 17, p. 643, followed by the general remarks contained in Letter No. 7, p. 644, urging the cultivation of that trait of human kindness that makes the whole world akin, if true, would stamp me as a being wholly devoid of humanity and not possessing the qualities of true American citizenship.

In my article bearing on this subject, COAL AGE, Sept. 12, p. 440, I attempted an ethical analysis of the characteristic traits of the foreign element with which I have come in contact and of whom I have had charge. It is a mistake to suppose that such an ethical analysis describes my relation to and treatment of the individual. In endeavoring to find a solution of the vexed problem of foreign labor in mining, it was necessary to analyze the characteristic traits of this class of immigrants, in order to discover if they possessed the fundamental principles on which American citizenship is founded, before attempting to formulate a method for the assimilation of this element. My analysis failed to reveal such principles.

I repeat again, the Latin-European is a product of misgovernment. It is not his fault but his misfortune; and, in this respect, he deserves the sympathy and support of all true men. His assimilation to our social customs depends, however, on his manifesting such a desire. He has inherited a moral fear and perversion of character, by reason of which it is impossible for him to break away from these associations and adopt the principles of American freedom.

Charlton Dixon infers that he must appreciate freedom "having fled the tyranny and injustice of his own country." I would like to feel assured of the truth of the premises on which such a conclusion is based. I would ask, Does the foreigner come to this country actuated by the *desire of freedom* or the *desire of gain*? If his love of freedom is so strong, why are thousands of these foreigners now returning to their own soil, willing to lay down their lives for the country from which they have fled? That he is actuated more by the love of gain than that of freedom is shown by the fact that he remains separated from his family for so many years and sends

home good American gold to support the powers that claim him body and soul.

Mr. Dixon doubts "if any mine official can recall a foreigner declaring his belief that earthly rulers exercise their authority by divine appointment." No doubt the answer to such a question would be in the negative. I have asked foreign miners simpler questions than that, which they have answered in the negative, though obviously their answer was contrary to their practical belief. Ask a foreign miner if he believes himself equal to the monarch of his country; and compare his answer with the one you would receive from an American citizen, in response to a question of *his* being the equal of the president of the United States.

Mr. Dixon testifies "to the loyalty of the foreign miner toward his employer," which I have failed to find true in my own experience. I might ask, Does the foreign miner consider the interest of his employer when desiring to take a holiday to commemorate the institutions of his homeland? Is it not a fact that many large plants have been compelled to suspend operations on such days and have worked short-handed for days following such a celebration?

I have been unable to harmonize Mr. Dixon's solicitude (?) for the education and moral welfare of the foreigner, with his statement that "whatever the foreign miner is or is not, we know, certainly, that he is a first-class man for loading coal. . . . Indeed, it would be a calamity if this class of immigration were to be replaced by a more highly educated type." The natural inference to be drawn from these remarks is that the foreigner is a good coal loader, which would not be the case if he were better educated. Therefore, he should be kept in ignorance.

In closing, Mr. Dixon eulogizes the humanity of Mr. Hogarth toward the foreigner. While such sentiments are just, they add nothing to Mr. Hogarth's American and Christian virtues. From personal acquaintance and knowledge, I know Mr. Hogarth to be a man who has the courage of his convictions and who practices what he preaches; and I do not believe that he regards his advocacy of such methods as in any way peculiar to himself, but rather considers them the practical virtues of every true American citizen.

Briefly, then, my argument is that the foreigner naturally possesses all the inherent attributes of his race, nation or class, which fact renders him morally perverted, although he is still capable of mental education. It is no argument to say that our own people frequently manifest similarly depraved moral natures, as I believe it can be shown that such depravity in them is always accompanied by a consciousness of wrongdoing, which eliminates the idea of moral perversion. But, when moral depravity is accompanied with a sense of right-doing, the subject so afflicted is morally perverted.

As a native born American, I hold very dear the principles laid down in the Declaration of Independence and embodied in the constitution of the United States. I regard no man as my inferior or superior, but consider all men "free and equal"; and, on this account, desire to treat every man with courtesy, kindness, consideration, humanity and justice.

I. C. PARFITT,
Asst. Mine Foreman.

Jerome, Penn.

Method of Working Under-lying Coal Seam

Letter No. 5—The problem of working a seam of coal $4\frac{1}{2}$ ft. in thickness and underlying another abandoned seam about 40 ft. above it, as presented by Mr. Lyman, COAL AGE, Aug. 29, p. 357, has not met with the response, from COAL AGE readers, that I had expected.

The main difficulty to be encountered, in the case under consideration, will arise from heavy roof falls. It is stated that frequent caves were experienced in working the upper seam, with similar roof strata, these breaks often extending to the surface. On this account, it may be assumed that the upper seam is full of water, which will prove a danger in working the lower seam. In any case, large water feeders may be expected should heavy caves occur. The flow of water from these feeders will vary with the wet and dry seasons.

I well remember a seam worked under similar conditions which was partially flooded and the mine laid idle for nearly two months. The water in that case broke through on the side of a fault, which extended to the old workings above.

From the fact that Mr. Lyman suggests driving the entries direct to the boundary, it may be assumed that the question of the mine paying immediate dividends is

not, in this case, of the first consideration. If such is the case, I am strongly in favor of driving the entries, at once, to the boundary. I would adopt the longwall-retreating system, on reaching the boundary.

It will be necessary to timber the roof at the face, well and systematically. It will also be necessary to "take up bottom" or "brush the roof," in order to make headroom on all the main entries, crossroads and levels. The choice between these two methods will depend on the nature of the material in the roof and floor. If the fireclay bottom is liable to give trouble, it should not be disturbed. The material taken from the roof can be used for building material at the roadsides. The stalls should be at such a distance apart as to give a rapid advance of the working face and keep the miner under a new roof.

The first weight, in longwall work, is almost invariably a source of trouble; and a good flow of water may be expected from the upper workings when this break occurs. However, after this trouble has once been overcome, a more gradual settlement of the roof will follow, in operating under this system of mining, and a further inflow of water will be largely prevented. Also, by this method, the effect of the pillars in the old workings above will be reduced to a minimum.

J. E. SPICER.

Cumberland, B. C., Canada.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

PUMPS

Definition—The term "pump" relates to any device, machine or mechanism by which water, oil or other fluid is impelled or forced through a pipe line; or elevated from a lower to a higher level; or air or vapor is compressed into a tank or exhausted from a vessel or chamber. The action, in any of these cases, is termed "pumping;" and the device or machine used is called a "pump."

Classification—Pumps are classified in many ways, according to their style, type, action, mode of construction and use for which they are designed, and other distinguishing features too numerous to mention. The following are the more important classifications:

1. **Style**—Horizontal, vertical, power, flywheel, etc.
2. **Type**—Single (simplex), duplex, or triplex; simple, compound, or triple-expansion.

3. **Action**—Reciprocating or rotary, single- or double-acting, direct-acting, suction, lift, or force pumps, displacement pumps, jets and turbines.

4. **Kind**—Piston or plunger, outside- or inside-packed, etc.
5. **Use**—Air pumps, boiler-feed, sinking pumps, etc.

The above terms are, for the most part, self explanatory. A few, however, require to be defined, in order to make clear their meaning or significance.

A **power pump** is a pump driven by a separate engine or motor with which it is connected by a belt or chain or by gears, in distinction from a **direct-connected** or **direct-acting pump**, in which the steam or air cylinder and the water cylinder or pump barrel have a common piston rod and a common stroke.

A **flywheel pump** is one whose action is equalized and made more uniform through the energy stored in a heavy flywheel. The flywheel is more commonly used on a high-duty **geared or power pump**; or a single direct-acting pump when the steam or air is cut off before the end of the stroke.

A **single pump** is one having a single pump rod, regardless of the number of steam or water cylinders.

A **duplex pump** is one having two pump rods and water cylinders so connected as to operate alternately on the water column. In like manner, a **triplex pump** has three cylinders operating uniformly, in turn, on the water column.

A **simple pump** is one in which the steam-end is not compounded, in distinction from a **compound pump** having two steam cylinders operating a single pump rod; a **triple-expansion** with three steam cylinders on one pump rod; or a **cross-compound**, which is a duplex pump having two pump rods and water cylinders, but in which the exhaust steam of the high-pressure cylinder is discharged as live steam into the low-pressure cylinder.

In **reciprocating pumps**, the action is to and fro; while in **rotary pumps** the impellers rotate on an axis.

A **single-acting pump** draws water in one stroke only and discharges it in the following stroke; while a **double-acting pump** draws and discharges water in each stroke of the piston. A **direct-acting pump** is one where the steam and water ends are in line and connected so as to have a common stroke.

The Coal Age Pocket Book

Suction—In actual fact, there is no such thing as "suction." The term is used, by common consent, however, to describe the effect of atmospheric pressure when exerted against a vacuous space from which the air has been partially exhausted.

A **suction pump** is one that acts to draw water only. In a **lift pump**, the water column is lifted by the upward movement of the piston; while in a **force pump** the water is forced upward or through the pipe line by the piston or plunger, which may be moving in either direction.

The action of a **suction pump** is clearly illustrated in Figs. 1 and 2, where the water is shown to be entering the pump barrel through the suction valve A, in each case, while the piston P is moving upward as indicated by the arrows.

The action of a **lift pump** is also shown in the upper portion of Fig. 1, where the water above the piston P is being lifted by the upward stroke and passes through the discharge valve B into the discharge or column pipe D.

The action of the **force pump** is also shown in Fig. 2. When the piston P moves downward, the suction valve A will close and the discharge valve B open.

The piston thus forces the water out of the pump barrel into the pipe line or column pipe, from which it is discharged against any head, limited only by the pressure of the steam in the steam cylinder of the pump.

Displacement pumps are a class of pumps in which the water is displaced or caused to move by direct contact with air or steam, the former taking the place of the water and driving it out; and the latter, by its condensation, creating a vacuum into which the water rushes.

A **jet pump** or **injector** is a device in which a jet of steam issuing from a nozzle entraps sufficient air to create a partial vacuum in the chamber surrounding the nozzle. As a result, water fills the chamber and, condensing the steam, is discharged through a tube.

FIG. 2. SINGLE-ACTING SUCTION AND

FORCE PUMP

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Examination Questions

Mine Foremen's Examination, Held at Price, Utah, Sept. 15 and 16, 1914

(Selected Questions)

Ques.—In the event of your firebosses finding danger from gas, bad roof or other causes, what precautions would you insist on their taking to keep workingmen from entering those places?

Ans.—The fireboss should at once fence off the entrance to such place, by putting a suitable danger signal there, to prevent anyone from entering the place unwarned. The same precaution should be taken in respect to all the openings or entrances to the place. He should also make a note of the danger and, on his return to the shaft bottom after completing his examination, he should remove the checks of the men working in those places, holding these and turning them over to the mine foreman, at the same time informing him of the nature of the danger in each working place.

It will then be the duty of the mine foreman to see that immediate steps are taken to remove the danger and to prevent the men working in those places from proceeding into the mine. No miner should be permitted to pass into the mine without having first received his check; and the absence of this from the check board should be sufficient warning for the man not to enter the mine.

Ques.—What is meant by "splitting the air current," and what advantages are derived from such methods?

Ans.—The term "splitting" relates to the dividing of the air current into two or more separate currents, each of which will ventilate a separate portion of the mine or district before returning to the bottom of the upcast shaft.

The advantages to be derived from splitting are, briefly, as follows: 1. The ventilation of the mine is under better control, since it is then possible to regulate the quantity of air passing in each district, according to the existing conditions. 2. Better air is supplied to the working face in each district, since the gases generated in one section of the mine do not pass into another section, but return at once to the main-return airway. 3. A larger volume of air can be circulated with less power than where the air current is undivided. 4. The air travels the working face at a more moderate velocity, thereby decreasing the danger and inconvenience to the workmen, common to a high velocity. 5. Finally, a local explosion of gas or dust occurring in one district is less liable to be propagated throughout the mine.

Ques.—If you were a mine foreman in a gaseous mine, how would you arrange and distribute the air current to insure the greatest safety to life and property?

Ans.—As far as practicable, a gaseous mine should be divided into separate ventilation districts. Each of these districts should be ventilated by a separate split of air taken from the main current. The return air from each district should be conducted at once into the main-return

airway. The quantity of air thus supplied to each district should be proportioned to the needs and conditions in the several districts. The quantity of air passing in each district should not be less than 150 cu.ft. per man, per min.; and, in a dusty mine or a mine generating large quantities of gas, not less than 200 cu.ft., per man, per min., should be allowed. The size of each district should be limited so that the quantity of air required, on this basis, will not cause too high a velocity at the working face. This velocity should not exceed 5 or 6 ft. per sec., and is commonly less.

Ques.—There is passing through an airway 35,000 cu.ft. of air per min.; what will be the velocity per second if the size of the airway is 7.5×5.5 ft.?

Ans.—The sectional area of this airway is $7.5 \times 5.5 = 41.25$ sq.ft. The volume of air passing per second is $35,000 \div 60 = 583.3$ cu.ft. Therefore, the required velocity of the air current is $583.3 \div 41.25 = 14.14$ ft. per second.

Ques.—What will be the reading of the water gage when the pressure per square foot is 20 lb.? Explain fully.

Ans.—The weight of a cubic foot of water may be taken as 62.5 lb. This weight corresponds to a pressure of 62.5 lb. per sq.ft. when the water is 12 in. deep; or, as we say, for a water column of 12 in. Therefore, the pressure, in pounds per square foot, for each inch of water column, is $62.5 \div 12 = 5.2$ lb. To produce a pressure of 20 lb. per sq.ft. would require a water column (water gage) of $20 \div 5.2 = 3.84$ in.

Ques.—(a) Explain the formula for finding the weight of air per cubic foot, at different temperatures and under different pressures. (b) Find the weight of one cubic foot of air at 60 deg. F., barometer, 30 inches.

Ans.—The formula for finding the weight of a cubic foot of air at any temperature t and barometric pressure B is

$$w = \frac{1.3273 B}{460 + t}$$

The constant 1.3273 is the weight of one cubic foot of dry air, under a pressure corresponding to 1 in. of mercury column and 1 deg. absolute temperature, of the Fahrenheit scale. This is multiplied by the barometric pressure, in inches of mercury, and divided by the absolute temperature of the air; because, the weight of air per cubic foot increases directly as the pressure and inversely as the absolute zero of the Fahrenheit scale.

Ques.—If 13 cu.ft. of air, at a given temperature and pressure, weigh 1 lb., how many tons of this air pass through a mine in 8 hr. when the current measures 52,000 cu.ft. per min.?

Ans.—The weight of air passing per minute, in this current, is $52,000 \div (13 \times 2000) = 2$ tons. The weight of air passing in 8 hr. is then $8 \times 60 \times 2 = 960$ tons.

Coal and Coke News

Washington, D. C.

While actual governmental measures affecting the coal industry are in abeyance, pending the reassembling of Congress, there have been few occasions when so many large administrative undertakings certain to exert a powerful indirect effect upon the industry were under way and approaching a climax. Both in regard to control of the form of industry, the establishment of new conditions affecting credit, and the favorable regulation of charges for transportation, as well as in several other directions events are leading up to significant changes in the situation.

Prospect for Rate Case

The Interstate Commerce Commission is now quite definitely understood to have finished its deliberations in the railroad rate case, wherein an advance of 5 per cent. was demanded by the Eastern lines. The consideration of the case has been unofficially announced as to take place during the first half of November, the period of the "November conference" which terminated Nov. 16. This signifies, it is understood, the handing down of a decision by about the middle of December.

Despite the lack of any absolutely official announcement on the subject the opinion is still generally and confidently entertained in well informed quarters that there will be little or no disposition to alter the position taken in the former decision in the five per cent. case. The prospect that that decision will stand seems to be strengthened in a material degree by the reliably reported determination not to regard the war and the investment conditions growing out of it as having any immediate connection with the rate question.

The elimination of the war itself and of its probable effect on the sale price of securities from consideration, means that the case is left much where it was at the end of the discussion of last summer. This in fact appears to indicate that the chief argument adduced in favor of reopening the case—the effects of the war and the probable consequences as regards both railroad revenues and railroad credit—had been ignored or ruled out of court. The attitude taken is such as to apparently throw a double safeguard around the prospects of shippers of heavy commodities such as coal.

Trade Commission

The inauguration of the new Trade Commission plan of dealing with the "trust question" within the next few days is expected to exert an important influence upon agreements in the coal industry. It will be recalled that during the early stages of the legislation an effort was made to secure the insertion of special provisions relating to the coal mining business. This was on the ground that mining of bituminous coal was then being conducted upon an extremely close margin of profit so that operators desired to be allowed to enter into agreements, such agreements, however, to be subject to close government supervision and regulation.

Bills to this effect were subsequently introduced but never made much progress. The act as finally adopted, however, contains authority for the Trade Commission to investigate from time to time trade conditions in any branch of business, while elsewhere power is given to secure the taking of steps designed to determine any improper or unfair business or trade methods. The belief now prevails in trade circles that as a result of these powers the new commission will yield to the desires of various coal interests and will make a careful study of conditions in the coal industry which, it is predicted, will lead to the tacit or open sanctioning of suitable working agreements among miners designed to govern the working of the mines, upon a reasonable and equitable basis.

The Banking Legislation

The coal industry among others is looking with interest to the effect of the new banking legislation upon the trade and confidently expects to see it exert a beneficial influence upon the general condition of business. This will be twofold in nature as it will tend to bring about the use of short time paper in the industry itself and in branches of business closely connected with it; while it will release much capital heretofore unnecessarily "tied up" in **over-large bank re-**

serves. The effect is expected to show itself in a quickening of industry in many directions, as well as in greater stability of business everywhere and in the elimination of the various shocks to which trade has been subject in consequence of uncertainty of credit and unexpected stoppages from time to time.

One phase of the situation that is of special interest in the coal mining regions is seen in the greater protection of postal savings deposits expected to be secured through the placing of the deposits in member banks by the post office department, thereby securing for them the safeguards established by the system as a whole. Postal savings deposits are made to a large extent by foreigners accustomed to the postal savings systems of European countries. There is an unusually large number of foreign depositors of this class among the miners in the various coal-mining communities in different sections of the United States, and their funds will gain added protection under the new system of banking.

PENNSYLVANIA

Anthracite

Seranton—Under the direction of the Board of Trade, petitions are being circulated through the city to be presented to the various coal mining companies asking that the retail price of coal here be put on the same basis as that in Wilkes-Barre, where the rate averages 20 per cent. lower.

Pottsville—John Evans and William Schreiner, coal miners who had been imprisoned for four days behind a fall of coal, were finally rescued alive. The rescuers, who felt sure that the men could get sufficient air for several days, worked in a limited space, digging desperately in an effort to reach the imprisoned men, the greatest excitement prevailing meanwhile at the mine opening.

Hazleton—Because of the scarcity of water in this section the mine operators are threatened with a situation that will make it necessary for them to close down the mines unless rain arrives soon. It is stated that already eight or nine collieries are in grave danger from a scarcity of water.

White Haven—A force of men has been at work for some time dismantling the Pond Creek Coal Co.'s breaker. On account of the property being flooded out and the continuous litigation between owners of the land and the coal operators, it now looks as if the mine will remain closed indefinitely.

Mahanoy City—The Philadelphia & Reading Coal & Iron Co. has issued a sweeping order that hereafter employees found smoking on the premises either inside or outside the mines will be summarily dismissed.

Bituminous

Cresson—The mines of the Pennsylvania Coal & Coke Co. have been closed because of the great falling off in orders. Officers of the corporation state that there is no truth in a report which has been widely circulated that labor troubles caused the shutdown. There has been no trouble between the company and its employees, the officers state.

Johnstown—The Valley Smokeless Coal Co. recently broke all records for daily output, when a total of 1700 tons of coal per day was mined. There is much interest in the operations of this company, whose mines are nearly within the city limits. Several hundred men are employed by the company. Recently new mining machinery was installed.

Portage—The Blue Bird mine of the Portage Coal Mining Co. has been closed temporarily for repairs and improvement work. While the mine is closed down the Red Bird mine will take care of the normal output of the neighboring workings.

Connellsville—The position of the coke trade at the present time is one of "watchful waiting." While conditions are not improving, they are not getting worse, and production and output hang around 200,000 tons per week, which it is believed is the bottom.

Ebensburg—What is thought to be a new record in coal production for this immediate vicinity was established during the month of October, when mine No. 1, of the Ebensburg Coal Co., at Colver, produced 102,000 net tons. The output all came from a single opening and from a coal measure 3 1/2 ft. thick. Officials of this mine predict that they will have an output of 4500 tons per day by spring.

Pittsburgh—Coal mining is on a somewhat more active basis at present than it has been in the immediate past. This is accounted for by the fact that Lake shipments are being pushed forward before the ending of the shipping season. Furthermore, retail coal men have been buying more freely.

Washington—Alleging that he was injured and disfigured for life in an accident in the Allison mine at McGovern, on Nov. 16, 1912, Frank McCoy recently filed his suit in the courts to recover \$25,000 damages from the Pittsburgh Coal Company.

McDonald—Seven mines of the Pittsburgh Coal Co., along the Panhandle R.R. near here, were closed temporarily Nov. 14, affecting about 2500 men. It seems to be the consensus of opinion, however, that the shut-down will be but a matter of a few weeks.

Shankstown—Mine No. 5, of the Greenwich Coal & Coke Co., recently resumed operations after an idleness since May 15 last. About 150 men went to work.

WEST VIRGINIA

Clarksburg—Announcement was recently made that 10 or more mines in this section operated by the Consolidation Coal Co., would be closed indefinitely, general conditions being assigned as the cause. As far as is practicable the miners will be transferred to operative mines.

Bluefield—It is stated that business has shown an improvement throughout this section of the coal field during the past few days. It is alleged that many more men are at work and the production and shipments are much brisker, with the outlook of a substantial increase soon.

Fairmont—Officials of the United Mine Workers of America have again planned to make an effort to organize the coal miners of the Fairmont district. This effort will doubtless meet with resistance and it is feared trouble may follow. It is thought that the first move of the coal companies against the proposed organization will be the securing of an injunction restraining union agents from entering upon the property of the operating companies.

KENTUCKY

Jenkins—The Consolidation Coal Co. has closed a number of mines in this vicinity pending better coal markets. The Elkhorn Mining Co. has also closed several operations at Fleming, Haymond and Hemphill, throwing over 1000 men out of work.

Frankfort—On account of the fact that large numbers of employees of coal mines and other operations in the eastern part of the state have been laid off, the State Board of Arbitration, which is administering the Workmen's Compensation Act, has extended until Dec. 5 the date on which employers may file with the board the reports of payrolls for August, September, October and November.

Lexington—Mining students in the College of Mining Engineering in the State University were recently given a demonstration of the pulmotor and the uses to which it can be put in resuscitating miners overcome by mine gases. Prof. T. J. Barr, of the College of Mining Engineering, conducted the demonstration.

Henderson—The Deepwater Coal Co., it is announced here, will begin operation of the Spottsville mine in January. This is one of the numerous mines in this part of the country which this firm recently took over.

Louisville—Conditions in the western Kentucky coal field, where "possum hunters" were perniciously active some time ago, have quieted down to a degree, though for a time several of the mine owners considered appealing to the governor for troops. The most recent case of disorder was near Central City, where, it is reported, a gang of "possum hunters" a few nights ago "shot up" a negro settlement which was known as "Galilee." No serious damage was done, though it is reported 1000 shots were fired.

OHIO

Cincinnati—The United States District Court has been asked by Aaron A. Ferris, receiver of the Dominion Coal Co., for permission to advertise and sell at public auction a number of the company's old accounts which are rated as desperate and uncollectible by ordinary means.

Columbus—Agitation has been started in many places in Ohio for an increase of the death benefits to be paid under the workmen's compensation law, which at present is limited to \$3700. In order to get at the matter properly, a special committee has been named by the Ohio Industrial Commission to investigate the matter and report to the coming session of the General Assembly. In case the death benefits are raised, it will mean a large premium to be paid by coal operators.

Cleveland—Coal operators in Belmont, Jefferson and Harrison Counties anticipate extending their operations in order to be independent of the Ohio coal mining situation. Both the Purstlove-Maher Coal Co. and the Lorain Coal & Dock Co., it is said, are about to close deals for large acreages of coal lands in West Virginia. The latter company is said to be in the market for 20,000 to 25,000 acres of coal property.

Bridgeport—It is stated that actual want and destitution exist among the families of the 8000 striking miners of the 8th Ohio district. It is alleged that hundreds are facing starvation and death from cold and hunger. In many homes the children have scarcely enough clothing to cover them, and many of them are wasting away for want of substantial food.

INDIANA

Terre Haute—The nomination of officers of the United Mine Workers in District No. 11, which includes practically all of Indiana except the block coal field, has been closed and a ballot is to be prepared for the 150 locals having a membership of more than 20,000 for a secret vote next month. Only those persons who have consented to be candidates are on the ballot and the term of office is for a period of two years.

Linton—The Little Giant mine, which has been idle since Apr. 1, has resumed work. It employs 350 men.

Brazil—The official board of district No. 8, Indiana Mine Workers, is backing the miners in a strike at the Mary mine of the Otter Creek Coal Co., northwest of this city. Day men removed portions of the floors of rooms in the mine necessary to the laying of tracks. The miners contend this was their work, at \$1.10 a yard. The company agreed to give the miners half-pay for the two weeks which the job took but they demand full pay.

ILLINOIS

Belleville—On account of the open weather prevailing thus far, with no demand for coal, the somewhat extraordinary conditions in the mining country surrounding here, are expected will bring to a crisis a difference of opinion between the miners' organization and several of the members. With no employment, the miners are facing starvation, and there is talk of openly seceding from the union and leasing idle mines to be worked on a co-operative basis, if the union does not give its consent to an arrangement of this kind. This means a price war that will bankrupt every operator in the field that attempts to run his mine on other than a co-operative basis.

Glen Carbon—The fire which started in the pump room of mine No. 2 of the Madison Coal Corporation of St. Louis, on Nov. 8, spread to the boiler house, engine room, and air compressing station, and damaged the property to the extent of about \$25,000. This mine was recently dismantled and \$70,000 was expended in repairing old equipment and erecting new. It is one of the largest mines in southern Illinois and employs about 425 men, and has a capacity of about 6000 tons of coal per day. It is expected that it will be a month or more before operations can be resumed.

IOWA

Guernsey—It is stated that a 7-ft. vein of coal has been discovered at a depth of 72 ft. in practically the center of town. This discovery was made while a well was being bored for water. This place is 25 miles north of What Cheer, where coal has been mined for years. Speculators are already offering to take options upon the land, while prospectors are at work to ascertain the extent of the field.

COLORADO

Denver—According to the annual report of James Dalrymple, state inspector of coal mines, for the year 1913, increases are shown both in the number of men killed for each 1000 employed and for each million tons of coal produced in the state of Colorado. During the year in question 110 men met accidental death in the mines of the state. It is stated that there has been a steady increase in Colorado in the number of lives lost in the coal mines during the last three years, that is, 1911, 1912 and 1913.

PERSONALS

Dr. R. F. McHenry recently resigned his position as surgeon for the Penn-Mary Coal Co. at Heilwood, Penn.

Dorsey J. Parker, of Alabama, has been probationally appointed by the Secretary of the Interior to be a mining engineer in the Bureau of Mines in Pittsburgh, Penn.

E. D. Glenn, chief clerk for the Cabin Creek Consolidated Coal Co., has accepted the position of chief clerk to **J. R. Carey**, general superintendent of the Chesapeake & Ohio R.R. Co., with offices at Clifton Forge, Va.

Edwin W. Laubenstein, mine inspector for the Consolidation Coal Co., was recently presented with a watch and chain as a token of the esteem and appreciation of his services by the employees in the company's various mines.

Erskine Ramsey, who was recently injured at Tuscaloosa, Ala., during the launching of a coal barge, and whose injuries were for a time considered serious, is now said to be entirely out of danger.

W. S. Ingraham, of Bristol, Conn., a well known clock manufacturer, has just made a trip of inspection over his mining properties in southern Illinois, comprising several thousand acres now operated as the Illinois Fuel Co., with headquarters at Sparta.

John A. Schroeder, formerly general sales manager of the Hyatt Roller Bearing Co., has resigned, his resignation taking effect immediately. There will be no other change in the personnel of the organization so far as is now known. Mr. Schroeder's successor has not yet been appointed.

Governor Hatfield, of West Virginia, has appointed the following persons to represent the state at the convention of the American Mining Congress, to be held at Phoenix, Ariz., Dec. 7 to 11: **J. G. Bradley**, **E. O'Toole**, **F. F. Bayles**, **Percival Smith**, **Ernest Chilson**, **W. S. Mandt**, **Samuel Butler**, **O. Tibbitts**, **William Gillis** and **John O'Brooks**.

W. K. Kavanaugh, president of the Southern Coal, Coke & Mining Co. of St. Louis, has just returned from an extended trip on the Atlantic seaboard of South America. The trip was made for the purpose of ascertaining a future market for Illinois coals to move via either rail or water to New Orleans and Mobile. The Southern Coal, Coke & Mining Co. has recently installed a coal dump at East St. Louis, on the Mississippi River.

Dr. Harold B. Dixon, who left England last June to attend a convention of British scientists in Australia, is now on his way home. While stopping for a few days in Canada, he took the opportunity to pay a flying visit to the experiment station of the Federal Bureau of Mines, at Pittsburgh, Penn. Dr. Dixon has done much important work in the study of explosion waves in gaseous mixtures, in connection with mine explosion problems. While at Pittsburgh, a visit was made to the experimental mine at Bruceton, where two explosion tests were made for his benefit. Dr. Dixon expressed himself as greatly interested in the results of these tests. While in New Zealand, he was called upon to assist in the investigation of a recent mine explosion at that point.

OBITUARY

Henry J. G. Melcher, for the past 15 years treasurer of the W. J. Rainey Estate, died recently in New York City. Mr. Melcher was born in Cleveland and was 57 years old. He had been connected with the Rainey Coal & Coke Co. for 30 years, starting in its employ as a clerk. He is survived by his widow, two daughters and one son.

PUBLICATIONS RECEIVED

Department of the Interior, Bureau of Mines. "Hints on Coal-Mine Ventilation." By **J. J. Rutledge**. Twenty-one pages, 6x9 in., unillustrated.

Department of the Interior, Bureau of Mines. "The Prevention of Accidents from Explosives in Metal Mining." By **Edwin Higgins**. Sixteen pages, 6x9 in., illustrated.

Department of the Interior, U. S. Geological Survey. "The Production of Coal in 1913." By **Edward W. Parker**. Two hundred and nineteen pages, 6x9 in., with numerous tables.

CONSTRUCTION NEWS

Bens Creek, Penn.—Work on the \$200,000 improvement to be made in the operation of the W. H. Hughes Coal Co., was recently begun.

Barbourville, Ky.—A railroad line is being surveyed from Jellico on the Kentucky-Tennessee border for a distance of 16 miles through coal and timber fields of northern Tennessee.

Beaverdale, Penn.—Improvements which will cost many thousands of dollars are being made by the Beaver Run Coal Co. at this place. A large new tipple with the latest apparatus for the handling of coal is being installed.

Sharondale, Ky.—Contracts have been let for constructing a tipple and several houses by **W. L. Bailey**, general manager of the Williamson Coal Co., of Williamson, W. Va., and others. They will develop mines in this locality.

Carrolltown, Penn.—It has been announced that the Milson Coal Co. will make a new opening on its tract near the workings of the Carrolltown Coal Co. This is the latest development in this region and the only one for some time past.

Nelsonville, Ohio—The B. R. Coal Co., of Nelsonville, Ohio, which was recently incorporated with a capital of \$10,000, will develop a tract of coal land near Nelsonville. **S. P. Booth** has been elected president and **G. D. Ridenour**, secretary-treasurer.

Johnstown, Penn.—M. M. Sheesley & Sons recently completed the sinking of the air shaft for the Conemaugh Smokeless Coal Co. near Seward, and headings are now being driven. The shaft is 205 ft. deep, and the output of the mine will be eventually 1500 tons per day.

Scranton, Penn.—Timothy Burke has been awarded the contract by the Delaware, Lackawanna & Western R.R. Co. to strip a bed of coal in West Minooka. This bed runs from 8 to 15 ft. in thickness, but, on account of bad roof it was impossible to mine it, and stripping was decided upon.

Greenville, Ky.—The W. G. Duncan Coal Co. has bought equipment for a machine shop. This also includes electric power generators to be housed in fireproof buildings now nearing completion. A contract for a steel tipple of 3500 tons capacity has been let to the Roberts & Schaefer Co., of Chicago.

Wheeling, W. Va.—The survey of the proposed new railroad line to connect the rich coal district lying between Short Creek and West Liberty, has been completed, and the new line will be built next spring or at least started then. The proposed road will start at Short Creek, branching off the Pennsylvania R.R. at that point. The exact route is yet uncertain.

Bellaire, Ohio—The Johnson Coal Co., which owns and operates the mine at Pike Creek, 10 miles south of this city, has recently completed a number of improvements to its property. These include an air shaft, new boilers, new electric dynamo and engine, and the balance of the mine property has been repaired and placed in first class condition. The mine is now ready to resume work as soon as the strike in the eastern Ohio coalfield is settled.

Berwind, W. Va.—J. J. Boxley & Sons, of Roanoke, Va., have been given a contract by the Norfolk & Western Ry. to grade five miles of roadbed and build a 300-ft. tunnel from Riffe, W. Va., to the Cucumber Branch of Dry Fork of Tug River. This line will open up mining property of the Berwind Coal & Coke Co. The estimated cost of the proposed construction is about \$275,000, and the operators who have recently completed another job for the railroad company on Wolf Creek near the Narrows, Va., will push the work immediately. Two steam shovels and 200 men will be employed.

NEW INCORPORATIONS

Pittsburgh, Penn.—The Duquesne Coal & Coke Co. has increased its indebtedness \$60,200.

Boston, Mass.—The New England Coal & Coke Co. has increased its capital stock one million dollars, making its present capitalization \$1,500,000.

Chicago, Ill.—The Austin Coal & Coke Co. has been organized with a capital stock of \$5000 by **William T. Carlin**, **Samuel D. Rosenberg** and **William H. Holley**.

Brookfield, Mo.—The Linn County Coal Mining & Land Co., of Brookfield, has been organized with a capital stock of \$4000. The incorporators are **Albert Tamm**, **William H. Ashley** and **John J. Rafferty**.

Springfield, Ill.—The Groveland Colliery Co. has been organized with a capital stock of \$15,000. The incorporators are **G. W. Solomon**, **Edward C. Solomon** and **Peter H. Solomon**. The company will mine and deal in coal.

Holidaysburg, Penn.—The Oliver Coal Mining Co. has been organized here to mine coal in Blair and Clearfield Counties. The capital stock is \$5000 and the incorporators are all members of the Hewitt family of Holidaysburg.

Liberal, Mo.—A license to do business in Missouri was recently issued to the Liberal Coal & Mining Co., with a capital stock of \$35,000. All of the capital of the company is to be employed in Missouri, and the office will be at Liberal.

Beaumont, Tex.—The Vinton Production Co. has been organized with a capital stock of \$6500, for the purpose of developing coal, petroleum and other minerals. The incorporators are W. P. H. McFadden, George W. Newman and W. D. Gordon.

New York, N. Y.—The American Consolidated Cannel Coal Co. has been incorporated in Manhattan to do a general coal-mining business. The capital stock is \$100,000 and the incorporators are P. I. Hoffman, T. G. Macy, of New York, and J. R. Rose, of Loveland, Ky.

Charleston, W. Va.—The Lone Jack Coal Mining Co. of Iaeger, McDowell County, will have its chief works in the Sandy River district, in McDowell County. It has an authorized capital of \$2500 and its incorporators are John Damron, V. T. Strickler, Charles E. Horton, Eva Damron, Callis Horton and Margie Strickler, all of Iaeger.

Charleston, W. Va.—A charter was recently issued to the Dominion Co. of Pittsburgh, Penn. This firm will mine, manufacture, and deal in coal, coke and lumber. Its chief works and business offices will be located in Pennsylvania. The authorized capital is \$15,000, and the incorporators are Simon P. Patterson, Charles Alvin Jones, John Hunter, Robert M. Marshal, and George Cahoon.

INDUSTRIAL NEWS

Washington, D. C.—During the month of September there were 195 men killed in and about the coal mines of the United States, as against 173 for the corresponding month of a year ago. Practically all of these accidents occurred underground.

Columbus, Ohio.—B. F. Nigh, secretary of the Michigan-Ohio-Indiana Coal Association, announces that a large number of new members are being received daily. There is much interest in organization affairs since the fall season has opened.

Columbus, Ohio.—Retail dealers of Columbus are considering the plan of having retail quotations published in the local newspapers along with other market reports. It is believed that this would have the effect of making the market more steady.

Wellsburg, Ohio.—The heirs of Josiah N. Scott have recently conveyed to John A. Bell a tract of coal land in Independence Township, coal and surface included, but subject to certain oil and gas rights. The area of the farm was 142.42 acres, and the consideration was \$18,514.60.

Cincinnati, Ohio.—The receivers of the Cincinnati, Hamilton & Dayton Ry. Co. have published a notice calling upon all creditors to present their claims to the receivers on or before Jan. 1, 1915, at Cincinnati, under penalty of having claims not submitted disallowed by the court.

St. Louis, Mo.—The Heidbreder Coal Co., one of the oldest established retail coal companies in the city, turned its affairs over to its creditors during the past week, and it is understood that the business will be conducted in the future by the creditors, until it is on a paying basis again.

Columbus, Ohio.—At a recent meeting of the Columbus Coal Exchange steps were taken to secure heavier sentences on persons convicted of stealing coal from cars. A number of persons arrested recently have been given 5 days in the city prison, whereas formerly a sentence of 30 days in the workhouse was invariably given to coal thieves.

Hazard, Ky.—The Ashless Coal Co., at Lowthair, recently announced the prospective building of another short-line branch of railroad from the Louisville & Nashville to reach a new coal-mining plant on Davidson's Creek, the work of construction to start on or about Dec. 1. A first-class coal-mining plant will be opened, the preliminary work having already started.

Charleston, W. Va.—The State Department of Mines has recently issued a list of fatalities occurring in the mines of the state during the month of October. This shows that 34 deaths resulted from various accidents during that period; 26 of these were caused by falls of roof and coal; three by mine cars and locomotives; three men were electrocuted, one crushed in tipple machinery and one met death by an explosion.

Toronto, Canada.—Judge Carpenter, who was appointed as a commissioner to investigate the Hillcrest colliery explosion, in which 180 lives were lost, has issued his report, the gist of which is as follows:

The only solution that I can arrive at, as a result of the whole evidence adduced at the inquiry, is that the disaster was caused by the explosion of gas, the origin and seat of which is unascertainable. This explosion was augmented by the ignition of dust throughout the mine.

Washington, D. C.—The causes of the Colorado coal strike will be sought by the United States Commission on Industrial Relations in a series of hearings to be begun in Denver, Dec. 1. The commission will make no effort to bring about a settlement of the strike, but will limit itself to studying the conflict in its relation to the general problem of industrial unrest. Operators, union officials, public officials, citizens and officers of the militia will be called to testify.

Columbus, Ohio.—Application made to the Ohio Utilities Commission for a change in the authorization for the purchase of equipment by the New York Central Lines has been granted. The former authorization provided for 1000 box cars to cost \$1,025,000 and 2400 gondolas to cost \$2,237,000, the latter for the Toledo & Ohio Central. The amendment provides for the purchase of 2500 gondolas and nine Mallett locomotives for the Toledo & Ohio Central to be used in handling coal.

Cincinnati, Ohio.—The proximity of Cincinnati to three great coal fields—those of Kentucky, West Virginia and Ohio—is given as the reason for the fact that power costs less here than in any other city in the country, the price per horsepower year being figured at \$13.64. At Buffalo, where electric power generated by Niagara Falls is available, the cost is \$14.96 per horsepower year, while at other cities the cost reaches much higher figures, Cleveland being near the top with a cost of \$37.11.

Columbus, Ohio.—No announcement has been given out by John S. Jones, the purchaser of the stock of the Sunday Creek Co., as to the future of the concern. Mr. Jones, who is well known in Ohio coal fields, was in Columbus for a few hours last week but no statement was forthcoming. As far as is known the present officers of the Sunday Creek Co. will continue. They are E. A. Cole, president; Stewart C. Gailey, vice-president and auditor; C. J. Andrews, vice-president in charge of sales; H. J. Reese, secretary and treasurer and N. D. Monsarrat, manager of mines.

St. Louis, Mo.—The banquet of the St. Louis Coal Club, held at the American Annex Hotel, on Nov. 11, which 225 coal men attended, was a record breaker for a coal trade gathering in the Middle West. The speaker of the evening was F. S. Peabody, one of the largest coal operators in Illinois, who discussed coal trade conditions as they are today, and delivered a talk on "A Piece of Coal," illustrated with moving pictures, showing the methods of mining at mine No. 3 of the Peabody Coal Co. The second reel of pictures showed the workings of the Nokomis mine of the same company. Other speakers of the evening were T. P. Brewster, president of the 5th and 9th District Operators' Association; Edward Devoy, a prominent retailer of St. Louis, and T. J. Frier, purchasing agent of the Wabash R.R.

St. Louis, Mo.—It is understood that negotiations, which have been under way now for about three months, for the purchase, outright, of 45 mines in the 5th and 9th districts of Illinois and which proposition has been recently taken over by Hugh Murray, a former coal operator of Equality, Illinois, will be put through between now and the 15th of December. If the syndicate which is negotiating for these properties succeeds in getting them, it is understood that at least 8 mines will be dismantled and abandoned. The tonnage of the remaining operations will be restricted so that there will not be a surplus of coal on the market at any time. If this deal goes through, it will be one of the biggest transactions ever recorded in coal mining circles in the Middle West, and will involve between \$12,000,000 and \$15,000,000.

Salt Lake City, Utah.—A decision regarding coal land was recently rendered by the Secretary of the Interior, which will reverse other decisions made in similar cases by the General Land Office, necessitating refunds in cases where land filed on before reclassification has been paid for according to the new valuation. In 1911, W. S. McCormick filed on a quarter section of land in Emery County, which, under the classification at the time of filing, was worth \$25 per acre. When final proof was submitted, he paid \$4000, the entire amount of the purchase price stipulated, but, meanwhile, a second classification had placed the value at \$117 to \$135 per acre. The \$4000 offered was accepted by the Land Office and held as part payment under the new classification, awaiting the decision of the Secretary of the Interior. The decision holds that McCormick accepted the offer of the government to sell the land for \$25, and that the government would be breaking its contract if it refused to sell at this price, providing the purchaser, in making final proof, complied with the regulations of the department. All previous decisions in conflict with this one are recalled.

Coal Trade Reviews

General Review

Anthracite shippers are aggressively canvassing for orders but the recent cold snap has steadied up the market. Tidewater bituminous stocks continue at a maximum and substantial concessions are obtainable. Situation generally unsatisfactory.

The recent cold snap the early part of the week had a much needed steady effect on the anthracite situation which was rapidly slowing down as a result of the long continued warm weather. Tonnage was becoming difficult to move, even under the elastic circular of the individual dealers, and it is evident that the first important break in the market was only avoided by a narrow margin. The situation is still uncertain, with shippers actively canvassing for orders, and it will take considerable cold weather to place the business on a seasonable basis.

In spite of the rigid curtailment at the bituminous mines, the volume of coal at Tidewater continues at the maximum, and more free cargoes were noted during the past week forcing prices down to the low levels again. Substantial concessions are necessary in order to keep the mines working, even on the present restricted basis. In the export trade the movement is being seriously interfered with by the heavy vessel demand for general cargo purposes. But in spite of these discouraging developments the improved sentiment following the recent election still persists and operators are hopeful for the outlook.

While substantial concessions on the old circular are readily obtainable in the Pittsburgh district there is such a meager inquiry that operators see little to be gained by establishing a reduced schedule. With general manufacturing down to a minimum and the Lake shipping definitely closed, the market is entirely dependent upon the domestic demand for any improvement; the colder weather recently has resulted in one or two spurts in this business which, together with an occasional increased demand reported at different points, has given a slightly better tone to the market.

The closing of the Lake shipping and the unusually mild weather has also caused a further restriction in Ohio. Retailers are showing no disposition to order except for forward delivery, and production is at a low point, but a turn in the weather may precipitate a heavy rush for coal since domestic stocks are believed to be at a minimum. Prices in the Southern market are irregular. Domestic coals are accumulating on demurrage as a result of the long continued high temperatures, but there seems to be indications of an increased demand for steam fuel.

There is little of an encouraging nature in the Middle Western market. The domestic coals are weak and competition so keen that prices are touching new low levels. The reaction has been furthered by heavy overshipments in anticipation of the expected cold weather. Conservative observers predict a further decline before there is any general improvement.

ATLANTIC SEABOARD

BOSTON

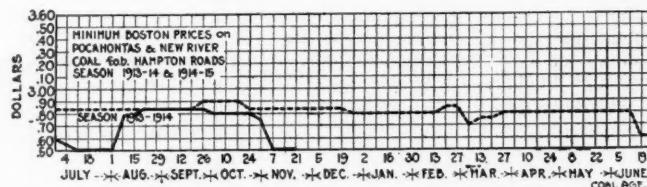
Outlook still discouraging. Some foreign inquiry but bottoms scarce. \$2.85 price liberally shaded on occasion, and market cargoes still in evidence. Anthracite also slow.

Bituminous—The volume of Pocahontas and New River at, and en route to Hampton Roads continues at maximum figures in spite of the rigid curtailment that has been in effect now for several weeks. The trade is about as lifeless as ever and there are almost no indications of any improvement in the near future. There has been a further renewal of certain foreign inquiry and it is felt that an increasing tonnage might be going off-shore but for the dearth of suitable carriers.

The coastwise trade shows no change whatever. What demand appears is confined closely to loading tonnage that is on time charters; other than this there is no relief to the prolonged dullness. The past week a few more "market cargoes" have turned up and prices at the distributing points

are once more forced down to low levels. The \$2.85 price at the Virginia terminals is only nominal and spot sales when made are at figures down to \$2.50. The new contracts still open are being held in abeyance because of the softness of the market and the expectation on the part of buyers that a few weeks more may see conditions still more favorable from their standpoint.

Georges Creek shippers are again getting behind on their orders, strange to say, but it is thought this is due partly to the very heavy curtailment at the mines and partly to a renewed call for export. This is a special condition, however, and cannot be said to apply to any other coal in the market.



Pennsylvania grades are having only the very lightest business. Marked concessions are still being made in the effort to keep mines running even if on a greatly reduced basis. Aside from a small contract movement there is little or nothing doing. All-rail the situation is no better than at tide-water.

Anthracite—All the shippers are actively canvassing for orders and the trade is having the first break-down this year. The independent operators have been making every effort to market their coal but even with elasticity of price they are unable to move any tonnage to speak of. Even stove size is now in plentiful supply with several of the companies and it would be a little difficult today to place an entire cargo of stove at any port in New England. There will hardly be any improvement until colder weather sets in.

	Clearfields	Cambridges Somersets	Georges Creek	Pocahontas New River
Mines*	\$0.85@1.45	\$1.15@1.50	\$1.67@1.77	
Philadelphia*	2.10@2.70	2.35@2.70	2.92@3.02	
New York*	2.40@3.10	2.65@3.05	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.50@2.75
Boston†				3.40@3.73
Providence†				3.20@3.63
* F.o.b.	On cars.			

NEW YORK

Bituminous movement badly congested on the Pennsylvania R.R. Market heavy but with an encouraging undertone. Anthracite steady at average levels and in a technically strong position.

Bituminous—Market optimists still consistently adhere to the opinion that there is a strong undertone to the trade, but with the Pennsylvania R.R. so badly congested that the movement to Tidewater is seriously delayed, and with the Berwind-White Co. still embargoed at South Amboy, it is difficult to accept such a hopeful view of the situation. On the other hand, it must be agreed that there is an improved sentiment as a result of the election returns, which manufacturing interests have construed in a favorable light. The impetus resulting from this has not been of large proportions, but it has been along conservative lines, and well maintained. Thus it is noted that some plants which were closed down entirely are beginning to resume operation on a small scale, while others are increasing their working schedules.

The bituminous market is spotty and decidedly irregular. Business is confined almost entirely to contracts, requisitions on which are probably at 60 to 70% normal. Though scarcely any business is being negotiated in the prompt market, prices are quotable on about the following basis: West Virginia steam, \$2.35@2.55; fair grades, Pennsylvania, \$2.55@2.65; good grades of Pennsylvania, \$2.70@2.80; best Miller Pennsylvania, \$3.10@3.15; Georges Creek, \$3.15@3.25.

Anthracite—The cold weather of the early part of the current week started the retail trade moving actively, but it will have to persist for some time before the improvement will be reflected in the wholesale end. As is always the case at this period of the year, it is purely a weather market

from now on. At the moment there is a healthy undertone to the situation, and business is steady at average levels, but it is clear that a serious break was impending had the cold weather not developed.

The outlook for the winter is most optimistic. The sales departments uniformly report a much reduced buying through the summer months, due no doubt to the scarcity of ready money. At a result, the trade is entering upon the winter business with very little available in the way of emergency surplus, and the situation is replete with grave possibilities. When the cold weather finally drives the consumers into the market, there will be such a rush that it will be necessary to limit the allotments temporarily, and this condition invariably creates much anxiety among the buyers, and causes a heavy run on the sales departments.

Prices are not quotably changed from last week, which we continue as follows:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken	\$5.10	\$4.60@5.10	\$5.05	\$4.55@5.05
Egg	5.35	5.00@5.35	5.30	4.90@5.30
Stove	5.35	5.35	5.30	5.30
Chestnut	5.60	5.45@5.60	5.55	5.30@5.55
Pea	3.55	3.45@3.55	3.50	3.35@3.50
Buckwheat	2.80	2.70@2.80	2.50@2.75	2.15@2.75
Rice	2.30	2.20@2.30	2.00@2.25	1.60@2.25
Barley	1.60	1.70@1.80	1.75	1.40@1.75

PHILADELPHIA

Anthracite trade still lagging on account of unseasonable weather. Bituminous shows some indications of a slight improvement in demand, but not in prices.

Anthracite—It will require considerably more cold weather than has as yet visited this locality to instill the snap into the market that should characterize it at this season of the year. Compared with the corresponding period last year, the trade is commencing to fall behind. The market for stove and nut continues good, and some of the companies are drawing on their stocks to supply the demand for these sizes, but egg is inclined to lag, and offers of as low as 50c. off the circular have been made by some of the individuals to dispose of this size. While this may be the exception, at the same time it points to the apathetic demand for this size, and still further emphasizes the fact that householders have not been called upon to replenish their stocks. Pea seems to be a little improved over the week previous, but buckwheat and rice are difficult to place.

Prices at Tidewater rule about as follows:

	Circular	Individuals
Broken	\$4.75	\$4.50
Egg	5.00	4.75 to 4.85
Stove	5.00	5.10
Chestnut	5.25	5.25

Bituminous—The past week has seen some slight improvement in the bituminous situation, but more in the shape of increased demand than in better prices. The standing coal at Tidewater has been considerably reduced, but operators are still rather loth to forward any coal to Tidewater points except on specific orders. Some substantial demurrage bills have been incurred, which has taught the traders to be cautious in the matter of forwarding coal to be sold on arrival.

BALTIMORE

Mine operations still further reduced and careful management now necessary. Demand and prices for soft coals poor. Anthracite brighter. Export trade holds up.

Mine operations, in line with railroads and all other industries, have been still further curtailed during the past week. Some important mines are now running on an average of not more than two days a week. The entire effort is to prevent overproduction at a time when sales are frequently ten to fifteen cents below actual costs.

In the West Virginia regions the demand for three-quarter gas has so far fallen off that the production of slack is now close to the actual needs of the immediate market, and that grade is the one exception in point of strength. While three-quarter is freely offered at from 80 to 85c. and run-of-mine coal around 70 to 75c. slack has moved upward from the recent low mark of 35 to 40c. to around 55c. Steam coals of West Virginia and Maryland are quoted at 80 to 85c. in many cases for less desirable grades. Pennsylvania low grade fuels can be had at 90 and 95c., while medium to best grades are selling at from \$1.15 to \$1.35.

The anthracite business here as a whole is brighter. Except for steam sizes the local demand is almost, if not quite, up to the seasonal average. Most coal men are now busy with deliveries. Movement from mines to tide and terminal yards here continues good.

In export lines there is a good tonnage moving. A large number of charters have also been announced for late November and December loading, assuring a continuance of a healthy foreign trade for some weeks at least.

HAMPTON ROADS

Dumpings for the week showing improvement. Prices firm. Stocks on hand about normal.

Dumpings over the piers at Hampton Roads for the past week have shown up well and indications are that shipments for the month of November will be considerably above those for October. Foreign and coastwise cargoes have made a good showing during the week and there has also been a fair number of bunker steamers taken care of. Although it is rather difficult to get information as to clearances of cargoes, it is understood that export coal has moved to Cristobal, Havana, Genoa, St. Lucia, Para, and ports in Chile and Peru. The coastwise shipments have been principally to the New England market with one cargo for San Francisco.

Quotations at Hampton Roads remain at circular with some little improvement in the demand for New River and Pocahontas run-of-mine but for the other grades there is only a small inquiry.

Stocks on hand in cars in the various railway yards are near normal. Some of the shippers have evidently been without sufficient coal to supply immediate orders as it is understood that coal has been taken from the storage plant at Sewalls Point to take care of some New England business. Of the coal moving coastwise, Boston and Providence have been about the largest receivers although Portland, New Bedford, Plymouth, and one or two other New England ports have taken fair sized cargoes.

Authoritative announcement of destination of vessels is no longer made but the following have cleared, presumably for the ports noted:

Vessel	Destination	Vessel	Destination
Driebergen	St. Lucia	Berwindmoor	Havana
Luigi Parodi	Genoa	Falk	(Unknown)
Robert Dollar	San Francisco	Denis	Para
Copenhagen	Chile and Peru	Haugaland	Canal Zone
Auchendale	Cienfuegos		

Note—Full cargoes were taken by all vessels except the "Denis" which had only a small quantity.

OCEAN FREIGHTS

Heavy demand for steamers in other lines and few vessels available. High rates prevail.

It is almost impossible to quote probable freight rates as the demand for steamers for grain, general cargo, horses, cotton, etc., continues unabated, and owners seem to be able to secure about any rates they ask on such business. There are a few steamers proposed for Mediterranean coal at rates varying from \$6 to \$6.60 and also steamers that will entertain coal to Valparaiso at about \$4.80, possibly \$4.32 with quick discharge guaranteed. Steamers do not respond to rates offered on coal to Brazil and the River Plate, notwithstanding the high offers on grain from the River Plate which should make the outward business attractive. We had no difficulty in closing the few boats that were offered for West Indian coals, although none of these charters have been reported.—W. W. Battie & Co.

COAL CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tons	Rate
Edna N. Smith	British	Baltimore	Martinique	735	
Florence Creadick		Philadelphia	Mayport	657	
Helen W. Martin		Philadelphia	Boston	2021	\$0.60
Wm. H. Clifford		Baltimore	Porto Rico	1378	
Nor	Norwegian	Philadelphia	Sagua	811	
F. Matarazzo	British	Baltimore	West Coast		
Levnet*	British	Baltimore or Virginia	Italy	1779	
Commodore Rollins	Norwegian	Baltimore	River Plate	2065	3.96
Thomas Winsmore		Philadelphia	Guantanamo	962	
Belgen	Danish	Philadelphia	Charleston	381	1.00
Sangstad	Norwegian	Baltimore	Havana	877	
			Preston and Banes	1459	

Note—Steamers are indicated by **bold face** type, all others being schooners.
*(previously)

COKE

CONNELLSVILLE

Rumors of a wage reduction making prospective purchasers for future delivery more cautious. Market continues extremely flat.

There has been considerable inquiry for contract furnace coke for next year, chiefly, it is believed, because consumers felt the market could not grow much worse, but in the past few days the talk of a prospective wage reduction has made the inquirers somewhat more cautious as a wage reduction

might result in another lowering of prices. No positive confirmation has been obtained that a Buffalo consumer has closed a contract for 10,000 tons or more a month for two years, on a sliding scale based on pig iron. Only small lots of prompt furnace coke have been selling. We quote prices partly nominal as follows: Prompt furnace, \$1.60; contract furnace, \$1.75; prompt foundry, \$2.15@2.50; contract foundry, \$2.35@2.50, per net ton at ovens.

The "Courier" reports production in the Connellsburg and lower Connellsburg region in the week ended Nov. 7 at 211,554 tons, an increase of 5590 tons, and shipments at 203,743 tons, a decrease of 3261 tons, production thus appearing to exceed shipments by 7811 tons. In 33 weeks the net surplus of production over shipments appears to have been 38,377 tons.

BUFFALO

Furnaces running slow or closed down everywhere and coke is still heavy. Ore and pig iron accumulating.

There is too much pig iron in the yards of the furnaces and too many furnaces are closed for the coke market to move yet. Iron men are hopeful, though, for they believe the present period of slow trade is about at an end. The export trade is looming up in raw material so that manufactured goods must soon be added to the list which will do much to relieve the situation, if iron is to be consumed. Prices remain on a basis of \$4.15 for best 72-hr. Connellsburg foundry, with stock coke \$3.20.

CHICAGO

Coke is quoted at: Byproduct, \$4.95; Connellsburg, \$5@5.25; Wise County 72-hr. (select), \$5 to \$5.25; gas coke, \$4.25; furnace coke, \$4.50@4.65.

THE STEEL MARKET

The trade continues hopeful but there is no improvement yet. October orders show a steady decline.

The better sentiment in the steel trade, which was evident one week ago, is more generally recognized, but it has not yet affected buying. The decline in orders shown by the Steel Corporation's statement as of Oct. 31 has not been checked, but the nearness of 1915 and the small provision made for the needs of manufacturing consumers beyond December bolster hopes of a turn near at hand.

A smaller loss in the Steel Corporation's unfilled orders last month than in September would give more reason for favorable comment had not October operations steadily declined. This week the situation in the Chicago district stands out, with the nearly complete closing down of the Gary works. Other mills there are running single turn and only part time.

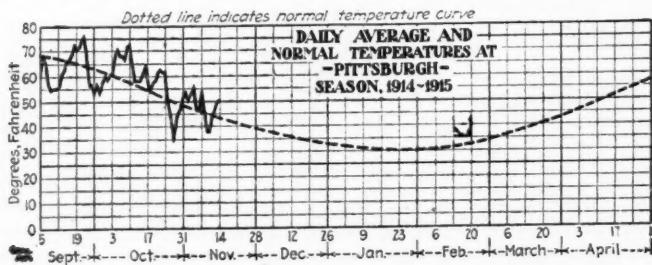
—“The Iron Age.”

LAKE MARKETS

PITTSBURGH

Naming of new circular prices not general. Lake shipments over and production decreasing to below 50%. Retail demand improved by weather.

Producers have been decidedly reserved about making official announcements of circular prices on contracts. As noted a week ago some of the producers have named a new series of prices, but the movement has not become general. The idea seems to be that as there is no inquiry for contracts it is just as well to allow the figment of the old circular prices, based on \$1.30 for mine-run, to remain for the present. There is no doubt that most operators would gladly close a contact on the basis announced by some, \$1.20 for mine-run.



The market is extremely quiet as to both prompt and contract. Shipments to the Lake trade are now practically over and the district is faced with very light operations for the next few weeks at least, at well under 50% of capacity. Manufacturing demand has decreased somewhat more and the retail demand is the principal dependence of sellers. This week has seen the inauguration of real winter weather, a

sort of mild blizzard arriving Monday, and retail demand is materially improved. The market feels the effect of wintry weather more keenly than would have been the case if retailers had not been so very conservative in recent weeks in their purchases. We quote nominal prices on contract as follows, prompt sales being usually made at 5 or 10c. less, with occasionally deeper shading: Slack, 85c.; nut and slack, \$1.05; nut, \$1.15; mine-run, \$1.20; 1/4-in., \$1.30; 1 1/4-in., \$1.40, per ton at mine, Pittsburgh district.

BUFFALO

The feeling is better as a rule as there seems to be no good reason for the light consumption. Anthracite moving in a satisfactory manner.

Bituminous—There is here and there a bituminous shipper who finds his trade a little better, with now and then a good day and sometimes a whole week, but the demand always drops off again. A stronger market often starts in this so there is a more hopeful feeling; in fact, there seems to be no good reason for a continuance of the light consumption. Export figures are astonishingly large, and there is considerable demand for manufactured goods.

One difficulty is that Canada is doing so little. The Canadian factories are shut down almost as tight as the European. There is less complaint of coal standing on track unsold. Jobbers usually throw back demurrage charges on the mines, which puts an end to such shipments as a rule. The weather is not yet favorable to any coal movement, but it must turn in the proper direction soon and many coal men hold that the upturn cannot be far away. Quotations remain on the basis of \$2.80 for Pittsburgh lump, \$2.70 for three-quarter, \$2.55 for mine-run and \$2.15 for slack, with slack more active than formerly.

Anthracite—The trade is quiet so far as wholesalers are concerned but it has seldom ever been in better shape at this time of the year. There has been about a normal amount of it sold and there is no clamor for any particular size. Egg is rather too plentiful but will improve with a turn in the weather. The New England demand is perhaps a little too heavy at present for the good of the Western trade, as it has lately cut down the supply in this direction, but the Upper Lake docks are well stocked as it is. At the same time the movement is steady, the amount reported by the custom house for the week being 140,000 tons, which is a good mid-summer average. The small ports have also been taking coal freely of late, so that all should be well supplied.

TORONTO, CAN.

Trade dull due to mild weather and industrial depression.

The coal trade remains quiet owing to the continuance of unusually mild weather and the financial stringency, which deters many purchasers from laying in supplies ahead of their immediate requirements. Prices for anthracite were again advanced the first of the month, and quotations are as follows: Retail, anthracite egg, stove and nut, \$8; grate, \$7.75; pea, \$6.75; bituminous steam, \$5.25; screenings, \$4.35; domestic lump, \$6; cannel, \$7.50. Wholesale f.o.b. cars three-quarter lump, \$3.78; screenings, \$2.64.

COLUMBUS

Dullness prevails in all branches. The Lake business is about over and warm weather is still having an adverse effect on domestic demand. Prices weaker.

The chief feature of the past week was the virtual closing of the Lake trade, which removes the last active department of the business. With unfavorable weather prevailing domestic business is still dull and as there is little demand for steam sizes, the entire trade is quiet. There are no immediate hopes for improvement, although a spell of colder weather would help materially. The tone of this market is not bad, considering conditions.

The Lake season has not been a satisfactory one to Ohio operators. Several valuable months were lost earlier in the year because of the strike. When the scale was finally settled in the Hocking Valley, a good deal of coal was rushed to the Northwest via the Lakes, but the total is only about two-fifths of normal seasons. Eastern Ohio did not share at all in the Lake trade. Some coal will be loaded during the latter part of November to be held in storage at the Upper Lake ports, but a considerable congestion on the docks there has been reported.

Domestic business is still slow, being curtailed by the mild weather. Retailers' stocks are not as heavy as formerly but dealers are not inclined to buy though some orders for delivery in December are being booked at current quotations. On the whole the trade is quiet and collections are bad.

Steam business is slow and there are little hopes of immediate improvement. Some strength has developed in the fine grades such as nut, pea and slack and coarse slack,

due to the curtailed production of domestic lump. Other grades of steam coal are rather weak.

Production is at a low point. The Hocking Valley district is producing only 40% of normal and the same is reported from Cambridge and Crooksville. In Jackson only 25% of the normal tonnage is being produced. The Pomeroy Bend district is in the best shape with a production of approximately 80%.

Prices in the Ohio field are:

	Hocking Valley	Pomeroy	Kanawha
Re-screened lump	\$1.55	\$1.65	
Inch and a quarter	1.50	1.55	\$1.40
Three-quarter inch	1.35	1.40	1.35
Nut	1.15	1.25	1.15
Mine-run	1.10	1.15	1.10
Nut, pea and slack	0.40	0.50	0.40
Coarse slack	0.30	0.40	0.30

TOLEDO

Steam buying reduced to the minimum. Shortage of fine coal as a result of the closing of Lake shipping.

Railroads are reflecting the stringent financial condition and in an effort to minimize expenses are buying nothing beyond their immediate requirements. Factories are nearly all running light and do not appear to be at all anxious as to the future possibility of securing fuel. They are therefore buying from hand to mouth only, and contracts for future delivery are few and of little consequence.

So warm an autumn, with so little domestic demand, has not been known in this country for many years. Of course there is some domestic demand, but the actual consumption is light. Slack is holding firm more because of the shortage in production than an increased demand. The cessation of Lake shipments cut off a large percentage of the fine coal supply. All demands are being met, however, and it is only a question of time until this phase of the business readjusts itself to the new conditions. Coal men are optimistic as a rule and profess to discern a marked improvement as a result of a loosening of the money market, and a general stimulation in all lines.

CINCINNATI

Warm weather and industrial inactivity cause further restrictions in the market. Prices remain steady in anticipation of impending changes.

Unseasonably warm weather continues to the detriment of the coal trade. The domestic consumption, considering the lateness of the season, is abnormally low. But there seems to be little doubt that dealers are lightly stocked, and as soon as cold weather begins, operators will find themselves swamped with orders for immediate delivery.

There is a slight improvement in business noted among steam users, giving rise to a belief that the situation will improve before long. Operations are necessarily much restricted, mines running only about three days a week in the West Virginia field.

CLEVELAND

Inquiry for certain grades of fine coal has given the trade a decided brace, but the coarse coal market is weak. Business shows an improvement and sales are larger.

The Consolidation Coal Co. is buying all the Fairmount slack that it can find; jobbers and brokers are selling it at 50 to 55c. It is being shipped to Michigan and Western trade. Considerable coal has been reconsigned to the account of this company. Pennsylvania slack is being held firmly at 70 to 75c. The Carnegie Steel Co. and La Belle Iron Works plants in the southern part of Ohio are buying all the Panhandle and Youghiogheny slack they can get. The production is light and the supply limited. West Virginia No. 8 operators have sold so much slack they are forced to make prepared sizes to fulfill contracts for fine coal.

With these conditions prevailing the current price for fine coal is \$1.70 to \$1.75 for slack on track Cleveland, excepting Hocking which is being sold at \$1.50@1.55. The out of town trade has been taking larger quantities of fine coal for the last three weeks and the Cleveland trade is showing a steady improvement. With 500 to 600 cars of coal on track at the opening of last week and a like number this week, the market is holding its own.

It was cold and windy Sunday and Monday of this week. While no marked inquiry for coal resulted, the weather had a beneficial effect and operators and jobbers refused to let go of the coal on track at bargain prices. They also were encouraged by the larger business of a week ago when the market stood up under an unusually heavy load. Smokeless coals are not in brisk demand and prices are holding firm at slightly lower levels.

The Lake trade is gradually cleaning up. The larger operators have shipped all the coal they will send forth this season although there are a number of cargoes to be moved, especially hard coal. The soft coal that is going forward now

is all for storage in vessels. The hard coal shippers will load for delivery at Upper Lake docks as late as Nov. 30, the last day of the official season of navigation.

Quotations for shipment are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmount	W. Va. No. 8
Lump	\$3.75				
Lump, 6 in.			\$2.45		
Egg	3.75				
Egg, 6 in.			2.10		
Lump, 1 1/4 in.		\$2.40	2.25		
Lump, 1 in.		2.30	2.10	\$1.95@2.00	\$1.95@2.00
Mine run	2.75	2.25	1.95	1.85@1.90	1.90
Slack	2.40	1.70@1.75	1.65	1.65@1.70	1.65@1.70

SOUTHERN

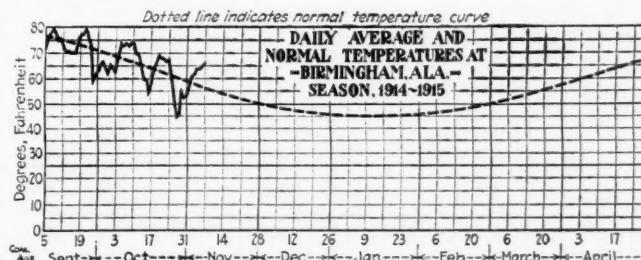
LOUISVILLE

Domestic coals accumulating on demurrage. Steam grades unchanged but more inquiries are noted. Prices irregular.

Though business conditions show indications of immediate improvement, the continued warm weather has seriously affected the domestic market. This is particularly true in the cities, though in the country sections the demand for domestic sizes is continuing fairly strong. Large quantities of domestic coals are on demurrage in Louisville and other railroad centers.

The market for steam coals is unchanged, though inquiries are said to be increasing and prospects are bright for better business in the near future. Many tons of low-grade screenings have been used as ballast on new railways; there is small market for that grade of fuel, and the operators have been turning it over to the railroad companies to be hauled away. Steam and small sized coals from several sections have no definitely established prices at present.

In a general way block coal may be said to be bringing from \$1.75 to \$1.90, though there are times when certain operators are glad to dispose of their output at little or no margin over the cost of production. Egg sizes range from \$1.25 to \$1.40 and nut and slack anywhere from 25 to 70c, according to grade.



BIRMINGHAM

Lump coal less active during the past week. Steam coal quiet though a slight improvement is evident.

Although one or two cool days slightly increased the demand for lump coal, it was only temporary, and with the return of warm weather again the market has taken a slump; there is practically nothing doing in this line, though a few days of cold, wet weather would materially increase the demand. Steam coal is just about the same as it has been for some time. The demand does not seem to increase, and contrary to the expectations of the operators, the bunker business at the Gulf ports is taking only a small tonnage. Prices on both lump and steam coal remain about stationary. Blacksmith coal is moving in about its normal tonnage, and the price is holding up well. There is little doing in the pig-iron business.

MIDDLE WESTERN

CHICAGO

Business further restricted and no improvement is noted. Continuance of mild weather causes additional price reductions. Screenings slightly stronger.

The exceptionally warm weather as shown on the temperature chart last week has caused a further weakening in prices and the market for all sizes is generally in a demoralized condition. Indiana and Illinois mines are curtailing production, and the bottom was again touched in screenings prices, although later they have stiffened somewhat, due probably to the lessened production of lump.

Cessation of activity in the packing industry has also been a large factor in the reaction. Some well informed producers predict that further declines will occur before there is any improvement. With Indian summer prevailing in the middle of November the situation seems about as hopeless as it could be. The domestic demand is weak and the competition for orders to absorb surplus production is so keen that all sizes of lump are being offered at lower figures. A considerable amount of free coal has been thrown upon the market in Chicago with a depressing effect. A number of cars of screenings were sold for freight charges here during the early part of the week, and several shipments sold at 5c. per ton.

The production in Indiana and Illinois is about one-half normal, and even this is more than ample to take care of immediate needs. Some Indiana mines have been closed down during the past week, and will not reopen until colder weather increases the demand. This should help the screenings situation. The Springfield district reports a little better demand for steam coal, and prices slightly increased.

The anthracite situation is very dull, although prices are held firm. The large consumers have not yet stored their winter supply of coal. A large tonnage is on hand in the local yards in case a cold snap should arrive.

Hocking Valley coals show but little activity. A considerable amount of splint coal is on track and the demand is weak with prices low. Franklin County mines are operating 40% normal; prices are off on all sizes except in screenings. Pocahontas remains weak, only contract obligations being fulfilled. Eastern Kentucky coals have been cut as much as 20c. per ton, without increasing orders which shows the folly of forcing the market when there is no demand.

Prevailing prices are as follows:

Franklin Co.	Springfield	Harrisburg	Sullivan	Clinton
Lump....	\$1.55@1.75	\$1.35@1.50	\$1.40@1.75	\$1.50@1.75
4-in. lump....				1.15@1.20
Steam lump....				
2½-in. lump....			1.35@1.50	
1½-in. lump....			1.20@1.35	
Mine-run....		1.10		1.10
Egg....	1.40@1.75		1.40@1.75	
6x3-in. egg....		1.35		
Nut....		1.25	1.25@1.75	
No. 1 nut....	1.35@1.75			
Screenings....	0.45@0.60	0.40@0.50	0.35@0.50	0.40@0.50
				0.35@0.50

Hocking Valley 1½-in. lump, \$1.40@1.60; mine-run, \$1.25.

New River and Pocahontas lump and egg, \$2.25; mine-run, \$1.25@1.40.

Somerset Smokeless lump and egg, \$2@2.25; mine-run, \$1.25@1.40.

Carterville lump, \$1.50@1.75; 6x3 in. egg, \$1.50@1.60; No. 1 washed egg, \$1.60; No. 2 washed egg, \$1.35.

INDIANAPOLIS

Situation irregular, with improvement in spots. Mild weather much against the trade. Mines working half-time on the average.

The November weather has been more like September as will be observed on the temperature charts. This means the minimum use of coal for all purposes and everything depends on the weather situation now.

About the only change in the market is a further sagging in the price of screenings. But the market is far from being back to the record-breaking low prices of a few weeks ago. In the open market slack commands about 50c., which is double the low point of the season. The steel plants at Gary, Ind., are running "on and off," operating one week, closed the next. On the other hand factories at South Bend and other cities have been increasing operations, due to large orders received from European governments.

November, like October, is going to show a material falling off from normal in volume of trade, though a good cold spell will help the situation materially. There is nothing to cause a movement of domestic lump, except the advancing season. Eastern coal is in the same condition as Indiana domestic. Mines are on about half-time. Prices are generally unchanged both at the mines and retailers' yards.

ST. LOUIS

Overshipments in anticipation of cold weather have brought the market to a standstill. Mines working two to three days a week. Weather proposition from now on.

Continued warm weather has brought the coal business to a standstill, both in the steam and domestic markets. Anticipating colder weather, some of the operators shipped out quite a tonnage of coal to reconsigning points, and this coal has the market flooded; dealers' sheds are loaded to capacity and the railroads are making more from demurrage charges than from freight.

In the Williamson and Franklin County field there is practically nothing doing, except on contract coal. The mines are

working two and three days a week, and usually have from one to two days' supply of coal on track. There is absolutely no domestic market which has enabled the shippers to take care of the steam sizes, even though there has been no advance in price.

There is no demand at all for anthracite and a considerable tonnage of it is under car service on the east side. There is no smokeless coming in and there is no demand. From this time on it is strictly a weather proposition, and the retailers, while doing nothing now, anticipate a somewhat more regular business in the way of small orders than in past years.

The prevailing wholesale prices are:

	Williamson and Franklin Co.	Big Muddy	Mt. Olive	Stand-ard	Sparta
2-in. lump....			\$1.25	\$1.05@1.15	\$1.20
3-in. lump....			1.40		
5-in. lump....	\$1.35@1.60		1.50	1.25@1.35	1.40
Lump and egg....	1.85@2.15	\$2.25			1.35
No. 1 nut....	1.20@1.40			0.75@0.80	
Screenings....	0.40@0.50		0.80@0.85	0.15@0.25	0.20
Mine-run....	1.05@1.10			0.75@0.80	
No. 1 washed nut....	1.50@1.60	2.25	1.60		
No. 2 washed nut....	1.30@1.35		1.35		
No. 3 washed nut....	1.10@1.15				
No. 4 washed nut....	1.00@1.05				
No. 5 washed nut....	0.20@0.25				

KANSAS CITY

Continued mild weather has resulted in the accumulation of a large surplus of coal.

There has been practically no change in temperature and the weather continues mild. The trade is overloaded, and when a ten-cent raise was considered for the first of November it was decided that the market could not stand it. It is feared that unless cold weather does not come within a short time there will be a break in the market, especially in slack. Few of the mines in Missouri, Oklahoma and Kansas are working more than half time. It was thought last week that in case the weather should suddenly turn cold there would be a car famine, but there is an overabundance of cars.

PORLAND, ORE.

Demand light, consumers neglecting to store for winter. Wood prices lower than a year ago due to the large supply of common labor.

It seemed a few weeks ago as if the coal dealers would have a good business, but the demand for domestic coal is light throughout the Pacific Northwest. This due to the belief that there will be no advance in prices and hence it would not benefit the consumers to store any large quantity. Buying so far this fall is considerably behind that for the same period last season. Wood has been cheaper as a result of a greater abundance of help and this has cut into the coal business to a considerable extent. Prices are the same as Sept. 1 and these will probably be maintained till next spring.

SAN FRANCISCO

The weather has been unusually warm so far this fall, resulting in a light demand for domestic and steam coal. Steam coal is wholesaling at \$6.50 and domestic at \$7.50, these being considered about normal quotations for this season of the year. There is a fair demand for anthracite, which is selling at from \$9.50 to \$11, according to the freight rates the shipper is able to secure. The retail dealers are well stocked and are anticipating a revival in the demand within the next week or so.

PRODUCTION AND TRANSPORTATION STATISTICS

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for April and the three months of the years 1913 and 1914:

State	February		March		April	
	1913	1914	1913	1914	1913	1914
Missouri...	260,586	259,270	259,270	263,593	204,255	179,723
Kansas....	414,414	492,304	492,304	501,841	444,142	378,192
Arkansas...	130,888	113,354	113,354	165,037	136,153	87,002
Oklahoma...	297,004	257,162	257,162	296,484	246,155	239,443
Totals....	1,102,891	1,122,090	1,122,090	1,226,955	1,030,705	884,360

This statement only covers the tonnage of members of the association, which is estimated to be at least 95% of the entire production.

THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended, Nov. 1, as follows:

	Surplus	Shortage	Net*					
New England Lines.	631	0	631					
N. Y.; New Jersey, Del.; Maryland; Eastern Penn.	11,131	0	11,131					
Ohio; Indiana; Michigan; Western Pennsylvania	32,532	0	32,532					
West Virginia, Virginia, North & South Carolina	6,904	10	6,894					
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida.	6,339	0	6,339					
Iowa, Illinois, Wis., Minn.; North & South Dakota.	4,773	0	4,773					
Montana, Wyoming, Nebraska.	824	0	824					
Kansas, Colorado, Missouri, Arkansas, Oklahoma	1,535	136	1,399					
Texas, Louisiana, New Mexico.	202	3	199					
Oregon, Idaho, California, Arizona.	2,748	125	2,623					
Canadian Lines.	0	0	0					
Total.	67,619	274	67,345					
July 1	July 15	Aug. 1	Aug. 15	Sept. 1	Sept. 15	Oct. 1	Oct. 15	
Surplus.	91,280	93,509	82,284	56,560	46,141	39,558	37,996	47,217
Shortage.	430	292	110	496	66	191	772	584
Net*.	90,850	93,217	82,174	56,064	46,075	39,367	37,224	46,633

*Bold face type indicates a surplus.

Note—The usual car supply chart appeared last week.

BITUMINOUS COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads during July and the first seven months of the last two years, in short tons:

	July		7 Months		
	1913	1914	1913	1914	
Baltimore & Ohio ¹ .	80,404	72,223	839,103	784,007	
Chesapeake & Ohio ¹ .	1,571	878	10,346	8,771	
Erie ² .	765,140	803,264	4,970,188	5,272,103	
Pennsylvania ³ .	719,944	693,545	6,138,175	6,347,822	
Virginian ¹ .	100	85	809	221	
Total 5 roads.	1,567,159	1,569,995	11,958,621	12,412,924	
Bituminous					
Baltimore & Ohio ¹ .	3,089,536	2,738,845	20,645,446	18,973,482	
Buffalo, Rochester & P. & L. ¹ .	806,763	634,963	5,367,876	4,496,965	
Buffalo & Susq. ¹ .	147,616	87,797	1,051,151	649,106	
Chesapeake & Ohio ¹ .	1,390,703	1,800,351	9,371,471	11,472,359	
Erie ² .	9,616	6,706	283,868	46,832	
Hunt & Br'd T. Mt. ¹ .	112,143	70,609	785,938	599,244	
New York Central ¹ .	721,614	720,469	5,190,466	4,644,012	
Norfolk & Western ¹ .	2,143,892	2,503,062	13,575,344	15,019,383	
Pennsylvania ³ .	4,551,528	3,966,357	28,833,947	27,521,539	
Pitts. & Lake Erie ¹ .	1,130,003	1,098,311	7,431,716	6,556,218	
Pitts. Shaw. & North ¹ .	233,664	144,034	1,558,512	1,342,554	
Virginian ¹ .	321,626	286,354	2,522,659	2,314,074	
Western Maryland.	229,391	265,331	1,959,176	1,792,130	
Total 13 roads.	14,888,095	14,323,189	98,577,570	95,427,948	
Coke					
Baltimore & Ohio ¹ .	391,483	255,650	2,829,371	2,035,511	
Buffalo, Rochester & P. & L. ¹ .	42,962	21,195	339,887	163,799	
Buffalo & Susq. ¹ .	24,604	43,834	180,026	208,637	
Chesapeake & Ohio ¹ .	29,945	25,033	210,483	232,788	
New York Central ¹ .	580	—	36,207	—	
Norfolk & Western ¹ .	110,709	88,507	951,351	669,175	
Pennsylvania ³ .	1,183,070	847,135	8,569,978	6,075,020	
Pitts. & Lake Erie ¹ .	494,053	411,398	4,119,403	3,104,975	
Pitts. Shaw. & North ¹ .	4,317	3,491	9,383	—	
Western Maryland.	—	—	44,410	41,996	
Total 10 roads.	2,281,725	1,696,243	17,290,499	12,591,901	
Total Coal and Coke 13 Roads	1913	1914	connecting lines.		
January.	19,314,523	18,157,998	2 ¹ Includes coal received from connecting lines.		
February.	17,594,079	15,446,830	2 ² Includes company's coal.		
March.	17,672,305	20,233,213	3 ³ Does not include company's coal hauled free.		
April.	16,882,326	15,497,444	Note.—The Southern Rail-		
May.	19,015,721	16,523,385	way hauled 321,374 short tons of bituminous coal during		
June.	18,610,757	16,984,476	June, 1914, and 1,947,470 short tons during the six months		
July.	18,736,979	17,589,427	ending June 30, 1914.		
Total 7 months.	127,826,690	120,432,773			

VIRGINIAN RAILWAY CO.

Shipments over this road for September and the past four months, with details of leading operators, were as follows, in short tons:

Shipper	June	July	August	Sept.
Knw., Glen Jean & E. R.R.	32,920	24,084	22,588	36,356
E. E. White ¹ .	26,073	29,424	34,884	29,654
Gulf Smokeless.	21,860	22,294	26,028	22,598
Loup Creek Colliery.	20,717	19,139	18,389	13,943
Slab Fork.	19,811	20,544	27,523	30,227
New River Collieries.	19,244	8,906	17,172	25,475
Pemberton Coal & Coke.	17,253	18,212	20,242	18,025
E. E. White ² .	16,253	18,788	21,631	22,646
McAlpin.	14,324	14,906	14,447	20,512
Winding Gulf Colliery.	13,278	14,268	18,938	20,049
Long Branch.	12,454	10,545	17,789	15,557
Bailey Wood.	11,707	11,544	13,141	9,845

¹ From Glen White. ² From Stotesbury.

Gross shipments from all mines totaled 379,113 tons as compared with 361,906 tons last month, 286,354 tons in August and 321,626 tons in July.

COAL AGE

FOREIGN MARKETS

GERMANY

Coke used as railway fuel. Resumption of shipments to Belgium. Companies passing dividends.

There have been greatly increased sales of coke, for which the chief cause may be found in the decision of the railway management to try the use of blast furnace coke, in place of coal, for steaming purposes. As the results were satisfactory in every regard, large orders followed, with a corresponding decrease in the accumulating stocks of coke which were beginning to be a source of anxiety to the operators. Further improvement in this business is looked for.

The demand for small sizes continues strong, with deliveries hard to obtain on a large tonnage.

From Duisburg on the Ruhr it is reported that shipments to Belgium, which had stopped with the outbreak of hostilities, had been renewed since the occupation of Antwerp, and have reached important proportions. An improvement of great promise to the entire coal and coke trade is the increase of transportation facilities.

Complaints of the passing of dividends are being made by stockholders to whom this action is a cause of distress, but from the point of view of the management no other policy is conceivable.

The war has already enacted a heavy toll from the younger men who were active in the management of the coal properties of the Empire; and this loss will be an added handicap to Germany in regaining her former position after the close of hostilities.—Translated from the "Frankfurter Zeitung."

The German output of coal during August and the eight months was as follows:

	August	1913	1914	1913	1914
Coal.	16,542,626	8,477,214	127,318,665	119,187,604	
Lignite.	7,250,280	4,377,955	56,658,980	56,401,120	
Coke.	2,747,680	1,522,250	21,418,997	20,127,970	
Coal briquettes.	507,693	263,275	3,910,817	4,019,897	
Lignite briquettes.	1,874,830	1,128,616	14,084,566	14,529,090	

ENGLAND

Trade dull and lifeless with some collieries closing down. High ocean freights are seriously restricting export business.

The London coal trade continues dull and lifeless. Huge quantities are arriving in the metropolis, and prices are difficult to maintain. The colder weather has slightly improved the demand, but buying is slow. Slacks and small nuts are plentiful. Bakers' nuts are firm. House coals are neglected. Only best hard steams are steady.

Scarcity of tonnage, high rates of freight and war risks insurance continue to remain the order of the day, and, of course, a great drawback to successful business. The inquiry is quite good, and better supplies of tonnage would immediately cause a revival in the export coal trade.

Two large collieries in Northumberland, the Newburgh Colliery and the Pegswood Colliery, have found it necessary to close down.

The question of the recent Minimum Wage Award for West Yorkshire has again claimed the attention of the Yorkshire Miners' Association, who have resolved to urge the Miners' Federation of Great Britain to take immediate action in the matter.—"Colliery Guardian."

Nov. 6—Business is on restricted lines at present owing to shortage of tonnage. It is anticipated, however, that the high rates of freight ruling will attract more tonnage, and on this account most contractors are not disposed to sell for forward shipment on the same terms as for prompt loading. Quotations are approximately as follows:

Best Welsh steam.	\$5.04@5.28	Best Monmouthshires.	\$4.02@4.08
Best seconds.	4.56@4.80	Seconds.	3.84@3.96
Seconds.	4.32@4.44	Best Cardiff small.	1.86@1.92
Best dry coals.	4.92@5.04	Seconds.	1.32@1.56

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both net, exclusive of wharfage and for cash payment.

Freights—Chartering is more active but orders are more numerous than steamers available, and rates continue to advance appreciably. Rates are today approximately as follows:

Gibraltar.	\$2.40	Venice, Ancona.	\$3.36	Singapore.	\$4.20
Malta.	2.76	Alexandria.	3.72	Las Palmas.	2.28
Marseilles.	3.56	Port Said.	3.72	St. Vincent.	2.52
Algiers.	2.70	Aden.	3.96	Rio Janeiro.	3.60
Genoa, Savona.	2.76	Colombo.	4.08	Monte Video.	2.64
Naples.	2.76	Sabang.	4.08	Buenos Ayres.	2.88

Coal Contracts Pending

Contract No. 8—Portland, Ore.—Proposals for furnishing and delivering about 5000 tons of bituminous coal for use on the Dalles-Celilo Canal construction work will be received at the U. S. Engineers' Office, Portland, Ore., until 11 a.m., Nov. 27, and then publicly opened. All communications should be addressed to Major of Engineers, Jay J. Morrow, U. S. Engineers' Office, Portland, Oregon.

Contract No. 9—Fort Wayne, Ind.—The Municipal Light, Heat & Power Co., of Fort Wayne, is in the market for 20,000 tons of screenings. Deliveries are to be made in hopper bottom cars during the next year. Address the Municipal Light, Heat & Power Co., Fort Wayne, Indiana.

Contract No. 10—Chicago, Ill.—The Chicago Coated Board Co. is in the market for 300 tons of screenings per day. Deliveries are to extend over a period of one year, and to be made at Chicago, Ill. Address the Chicago Coated Board Co., 420 E. North St., Chicago, Illinois.

Contract No. 11—Portland, Maine.—The Portland Gas Light Co. is in the market for 30,000 tons of Penn Gas, Westmoreland, or any good grade, three-quarter screened, gas producing coal for delivery between Mar. 1, 1915 and Mar. 1, 1916. Shipments are to be as required, about in equal monthly proportions, to wharf through one bridge, Portland, Maine, ample water alongside. All communications should be addressed to C. H. Tenney & Co., Managers, 201 Devonshire St., Boston, Massachusetts.

Contract No. 12—New York.—The bids on this contract, which provides for furnishing 2600 tons of anthracite to the National Guard for use at the various armories in the Boroughs of Manhattan and the Bronx, were as follows: The Meyer-Denker-Sinram Co., \$4.25 on buckwheat, \$7.65 on nut, and a total of \$11,560; John S. Conabeer, \$3.95 on buckwheat, \$7.44 on nut, and a total of \$10,793.50; Henry E. Meeker, \$4.39 on buckwheat, \$7.19 on nut, and a total of \$11,834; Garfield-Proctor & Co., \$4.10 on buckwheat, \$7 on nut, and a total of \$11,095; Thomas F. Farrell, \$4.30 on buckwheat, \$7.70 on nut, and a total of \$11,052. Previous notices regarding this contract have appeared in this column. Address C. B. Rhinehart, Secretary, Armory Board, Hall of Records, New York City.

Contract No. 14—Panama, C. Z.—Sealed proposals will be received by the Panama R.R. Co., until 12 o'clock noon, Nov. 24, for furnishing all or any part of the company's requirements, estimated at 500,000 tons of coal, as required during the year ending Dec. 15, 1915. Coal is to be of the best quality steaming, semi-bituminous, mine-run, with at least 40% lump, dry and free from slate, sulphur, dirt and other impurities, suitable and acceptable for use in stowage in the bunkers of steamers operating in tropical waters and susceptible of being stored in the climate of Panama without danger of fire through spontaneous combustion. Prices are to be quoted f.o.b. any loading port the contractor may designate on the Atlantic or Gulf coast, and the contractor will be notified on the twenty-fifth of each month of the amount required for the succeeding month. The contract will be awarded on a heat unit basis with a standard of not less than 70% fixed carbon and 14,700 B.t.u. per pound of dry coal. Bidders must state the commercial or trade name of the coal, together with the designation of the bed or beds and exact location of the mine from which they propose furnishing the coal. All bids must be accompanied by a certified check for \$1000 and, upon formal execution of the contract, the company provides that security not to exceed \$30,000 shall be required for the faithful performance thereof. Payment will be made 30 days after presentation of bills of lading signed by the captain of the collier accompanied by certificates of the companies operating the coal piers, indicating the number of cars and weight of each car load of coal dumped into the colliers. Contract form and specifications can be obtained on application to R. E. Rutherford, Assistant Purchasing Officer, Panama Purchasing Dept., 24 State St., New York.

Contract No. 15—New York Harbor.—Bids received on the United States Navy contract for 20,000 tons of steam coal were as follows, prices in all cases being delivered f.o.b. suitable lighters or barges alongside at Navy Yard, Brooklyn: American Coal Exporting Co. (14,429 B.t.u.), \$3.05; Consol-

dation Coal Co. (14,533 B.t.u.), \$3.38; W. P. W. Haff (14,300 B.t.u.), \$3.05; Keystone Coal & Coke Co. (14,600 B.t.u.), \$3.11; (14,100 B.t.u.), \$3.09; F. P. Long & Co. (14,400 B.t.u.), \$3.15; Pennsylvania Coal & Coke Corporation (14,500 B.t.u.), \$3.10; Quemahoning Coal Co. (14,300-14,700 B.t.u.), \$3.12; J. Tatnall Lea & Co. (14,480 B.t.u.), \$3.07; Willard Bros. (14,500 B.t.u.), \$3.30; J. H. Weaver Co. (14,567 B.t.u.), \$3.25. Archibald McNeil & Sons Co. submitted five bids, with coal ranging from 14,500 to 14,750 B.t.u., and prices from \$3.03 to \$3.28. Navy Department, Bureau of Supplies and Accounts, Washington, D. C.

Contract No. 16—New York Harbor.—The bids received for furnishing and trimming approximately 17,000 tons of bituminous coal required by the United States dredges in New York Harbor were as follows: W. P. W. Haff, Abrams Creek Coal (13,500 B.t.u.), \$3.60; Commercial Coal Co., Commercial Bituminous No. 1 (14,200 B.t.u.), \$3.60; Commercial Bituminous No. 2 (13,750 B.t.u.), \$3.50; Commercial Bituminous No. 3 (14,790 B.t.u.), \$3.85; Geo. D. Harris & Co., Inc., Margaret Coal (14,400 B.t.u.), \$3.60; New Creek Coal (13,700 B.t.u.), \$3.27; Hite & Rafetto, Bird Quemahoning (14,400 B.t.u.), \$3.43. Bids were opened Oct. 8. Maj. G. J. Dent, Corps of Engineers, Army Building, N. Y.

Contract No. 17—New York.—Sealed bids are requested by the Department of Public Charities for furnishing and delivering anthracite, bituminous and gas coal. Security aggregating 30% of the total amount involved in the contract will be required, and no bids will be considered unless accompanied by a cash deposit of 1½% of the total amount of the bid. The contract covers the period from Dec. 1 of the current year to Apr. 30 of next year, and bids will be opened at 2:30 p.m., Nov. 24. Blank forms and all further information can be obtained on application to Contract Clerk of the department, Room 1034, Municipal Building, Borough of Manhattan.

Contract No. 18—Brooklyn.—Sealed bids are requested for furnishing and delivering 560,000 lb. of anthracite peat coal to the 26th Ward Disposal Works, at the foot of Hendrix St., Brooklyn. Bids are to be made on the basis of 1000 lb. and must all be in by 11 a.m., Nov. 25. Security aggregating 30% of the gross amount involved in the contract will be required. Delivery will be as required, and will be concluded previous to Jan. 1. Blank forms and all other information can be obtained on application to the Bureau of Public Buildings and Offices, Borough of Brooklyn, Room 1003, No. 50 Court St.

FOREIGN

Guayaquil, Ecuador, South America.—La Compania de Alumdrado (Lighting Company) is in the market for 3500 tons of gas coal. Prospective bidders should state the specific gravity, weight per cubic foot, and space occupied by one ton of gas coal. Give approximate analysis, including moisture, fixed carbon, sulphur and ash, and a commercial analysis showing the gas per ton of coal, gas per cubic foot of coal, illuminating power of the gas in standard sperm candles, value of one cubic foot in grains of sperm, sperm value per ton of coal, coke per ton of coal (good quality), coke per cent. of coal, ash in coke, sulphur eliminated with the volatile products, sulphur in the coke, tar per ton of coal. Quotations should be c.i.f. Guayaquil. Address The Manager, Compania de Alumdrado, Guayaquil, Ecuador, South America.

South America.—Supplementing a previous notice, the Bureau of Foreign and Domestic Commerce at Washington states that details regarding a certain inquiry from South America have been forwarded to the department, and that complete information, including blank forms on which to submit bids for supplying coal under the conditions specified can be had on application. All inquiries should mention item No. 14,048, and be addressed to the Bureau of Foreign and Domestic Commerce, at Washington, D. C.

Santiago, Chile, S. A.—Bids are wanted on 300,000 tons of coal a year during the next three years, according to press reports. The coal is to be used on the Chilean Railway. All communications should be addressed to the Department of Materials, Santiago, Chile, S. A.